有効成分グリホサートおよびその代謝物に関する

公表文献の収集、選択等の実施報告書

検索対象期間：2006 年 7 月 1 日～2009 年 12 月 31 日

検　索　日　：2021 年 9 月 7 日
2021 年 10 月 14 日

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一 部 改 定 ：2022 年 11 月 21 日

ニューファム株式会社

1．検索に用いたデータベース

表１　文献検索に用いたデータベースの概要（報告書原文 p.9-11 Table 4）

データベース名	データベースの特徴 収集分野、等	収集範囲、文献検索時の文献数	更新頻度	検索日	検索対象期間
AGRICOLA	農業関連分野を後半に収集、生物学、生物工学、生態学、植物学等	1970～現在 670 万論文以上 （2019／9 月現在）	月 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
BIOSIS	生物学、生物医学関連の最大のデータベース 生物化学、免疫、病理、生理学、毒性学、薬学等	1926～現在 2,780 万論文以上 （2019／4 月現在）	週 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
CABA	農業関連 生物学、生物工学、林学、植 物学、食品工学、栄養学、土 壌、肥料学等	1973～現在 990 万論文以上	週 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
CAPLUS	化学関連 分析化学、生化学、化学工 学、有機化学等	1907～現在 670 万論文以上 （2019／9 月現在）	毎日	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
EMBASE	生物医学、薬学関連 生化学、医学、法医学、薬 学、公衆衛生、環境科学等	1947～現在 3,640 万論文以上 （2019／8 月現在）	毎日	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
ESBIOBASE	生物学、生化学全般 応用微生物学、細胞生物学、 生態学、環境科学、臨床医 学、分子生物学、毒性学、神 経科学、毒性学、植物学等	1994～現在 900 万論文以上	週 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
MEDLINE	米国国立医学図書館が提供する医学、看護、歯学、獣医学、保健医療分野から前臨床領域の文献を収載	1946～現在 3,350 万論文 （2022／1 月現在）	週 6 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
PQSCITECH	科学、技術全般を収載 25 のデータベースを統合	1962～現在 3,360 万論文以上 （2021／1 月現在）	月 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
SCISEARCH	科学、工学、生物医学の広範 な文献を収載	1974～現在 4,770 万論文以上 （2019／8 月現在）	週 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
TOXCENTER	薬学、生化学、生理学、医薬や一般化学物質の毒性等	1907～現在 1,620 万論文以上 （2022／1 月現在）	週 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31
FSTA	食品製造に関する科学、技術生化学、衛生学、毒性学、発酵学、生理学、植物病理学等	1969～現在 159 万論文以上 （2020／9 月現在）	週 1 回	2021/09/07 2021/10/14	2006/01/01 ～ 2009/12/31

２．検索に使用したキーワード、検索の条件

（１）対象とする農薬

表２　検索に用いたキーワード：有効成分グリホサート（報告書原文 p.13 Table 6）

一般名	Glyphosate Salts: isopropylamine, potassium, ammonium, methylmethanamine
IUPAC/CAS 名	2-(phosphonomethylamino)acetic acid
CAS 番号	1071-83-6 Salts: 38641-94-0, 70901-12-1, 39600-42-5, 69200-57-3, 34494-04-7, 114370-14-8, 40465-66-5, 69254-40-6
その他の名称	—

表３　検索に用いたキーワード：代謝物 AMPA（報告書原文 p.13 Table 7）

一般名	AMPA
IUPAC/CAS 名	(aminomethyl)phosphonic acid
CAS 番号	1066-51-9
その他の名称	—

表４　検索に用いたキーワード：グリホサートおよび代謝物（報告書原文 p.14 Table 8）

Gly: Glyphosate and AMPA	glyphosat? OR glifosat? OR glyfosat? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR 69254-40-6 OR aminomethyl phosphonic OR aminomethylphosphonic OR 1066-51-9

(1w) = proximity operator (this order, up to 1 word between)

AND / OR / NOT = boolean search operators

? = any character(s)

表 14　4 分野に関連する文献の検索に用いたキーワード（報告書原文 p.14-15 Table 9-12）

[Gly] AND 下記キーワード を用いた。

ヒトに対する毒性	tox? OR hazard? OR adverse OR health OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR in vivo OR in vitro OR invivo OR invitro OR mode of action OR skin? OR eye? OR irrit? OR sensi? OR allerg? OR rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR metabolism OR metabolite? OR metabolic OR distribution OR adsorption OR excretion OR elimination OR kinetic OR cytochrome OR enzym? OR gen? OR muta? OR chromos? OR clastogen? OR DNA OR carcino? OR cancer? OR tumor? OR tumour? OR oncog? OR oncol? OR malign? OR immun? OR neur? OR endocrin? OR hormon? OR gonad? OR disrupt? OR reproduct? OR development? OR malform? OR anomal? OR fertil? OR foet? OR fet? OR matern? OR pregnan? OR embryo? OR epidem? OR medical? OR poison? OR exposure OR operator? OR bystander? OR resident? OR worker? OR occupat? biomonitoring OR human exposure OR microbiome OR oxidative stress OR apoptosis OR necrosis OR cytotoxicity OR Polyoxyethyleneamine OR POEA OR surfactant OR risk assessment?
農作物及び畜産物への残留	uptake OR translocation OR rumen OR storage stability OR storage OR stability OR metabolic OR metabolism OR breakdown OR nature of residues OR residue? OR magnitude of residues OR process? OR effects of processing OR dessicant OR preharvest OR preemerg? OR ?resistant? OR ?toleran? OR transgenic OR hydroly? OR rotation? OR succeed? OR plant? OR crop? OR feed? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig? OR dietary OR assessment OR risk assessment OR consum? OR exposure
生活環境動植物及び家畜に対する毒性	tox? OR ecotox? OR ?toxic OR ?toxicity OR hazard OR adverse OR endocrine disrupt? OR bioaccumulate? OR biomagnifi? OR bioconcentration OR poison OR effect OR indirect effect? OR direct effect? OR biodivers? OR protection goals OR eco? OR impact OR population OR OR community OR wildlife OR incident OR wildlife OR incident OR pest OR bird? OR acute OR chronic OR long-term OR mallard OR duck OR quail OR bobwhite OR Anas? OR Colinus? OR wild OR dietary OR aquatic OR fish OR daphni? OR alg? OR chiron? OR sediment dwell? OR benthic OR lemna OR marin? OR estuarine OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR plant AND submerge? OR emerge? OR bee? OR apis OR apidae OR bumble? OR colony OR hive OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR protection OR model? OR vole OR pest OR arthropod? OR beneficials OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR decompos? OR micro organisms OR microorganisms OR microbial OR carbon OR nitrogen OR plant? OR vegetative vigo? OR seedling OR germination OR monocot? OR dicot? OR sewage OR activated sludge OR biodegrad? OR bioaccumulation? OR amphib? OR reptile? OR aquatic plant OR beneficial
環境動態	soil OR water OR sediment OR degradat? OR photo? OR soil residues OR soil accumulat? OR soil contaminat? OR mobility OR sorption OR column leaching OR aged residue OR leach? OR lysimeter OR groundwater OR contaminat? OR microb? OR exudation OR rhizosphere OR dissipation OR saturated zone OR hydrolysis OR drift OR run-off OR runoff OR drainage OR volat? OR atmosphere OR long-range transport OR short-range transport OR transport OR micronutrient OR phosphate OR iron OR manganese OR half-life OR halflife OR half-lives OR halflives OR DT50 OR kinetics OR off-site movement OR removal OR drinking water OR water treatment processes OR atmospheric deposition OR tile-drains OR surface water OR monitoring data OR disinfectant OR ozone OR tillage OR infiltration OR hard surface OR rainwater OR rain water OR chelat? OR complex? OR mineralization OR persistence OR ligand

表 15　評価対象となる生物種等に関するキーワード

ヒトに対する毒性	rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR operator? OR bystander? OR resident? OR worker? OR human exposure
農作物及び畜産物への残留	plant? OR crop? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig?
生活環境動植物及び家畜に対する毒性	bird? OR mallard OR duck OR quail OR bobwhite OR Colinus? OR aquatic OR fish OR daphni? OR alg? OR benthic OR lemna OR marin? OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR bee? OR apis OR apidae OR bumble? OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR arthropod? OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR micro organisms OR microorganisms OR microbial OR sewage OR activated sludge OR amphib?
環境動態	soil OR water OR sediment OR groundwater OR drinking water OR surface water OR rainwater OR rain water

なお、検索キーワードは製剤に関するものが入っていないが、欧州委員会に提出した公表文献検索と同様であり、その検索キーワードを用いて多くのグリホサート製剤に関する文献が検索されている。

また、当社の代表的な製剤である「Credit Xtreme」についてデータベース Web of Science を用いて検索したところ、「Credit Xtreme」および「Credit-Xtreme」ではヒットはなく、「Credit and Xtreme」で 3 件のヒットがあったがいずれも関係のない文献であった（添付資料）。

以上のことから問題はないと考える（これは「2006 年 7 月～2009 年 12 月」のみの公表文献検索についてだけではなく、「2021 年 8 月」までの検索についても同様である）。

3. 評価目的との適合性評価（第 1 段階、第 2 段階）及び信頼性評価で設定した判断基準

評価目的との適合性（第 1 及び第 2 段階）で設定した判断基準

第 1 段階：文献の表題及び概要に基づく適合性評価（RA） 第 1 段階として、文献の表題及び要約に基づき、下記の①から⑱に該当するものは明らかに評価の目的と適合しない文献と見なした。 ①有効性（耐性関連の記事、害虫/作物の防除の新しい使用法）または農業/生物学研究（作物科学、育種、施肥、耕作、基本的な植物生理学/ミクロ/分子生物学）に関連する論文 ②分析方法/開発を扱った論文 ③新しい合成方法の発見や開発または有機化学・無機化学の基礎的な部分を記述した論文 ④特許に関するもの ⑤廃水処理に関するもの ⑥規制リスク評価のための十分なデータ/情報を含まない会議の貢献に言及する要約 ⑦遺伝子組み換え生物/トランスジェニック作物に焦点を当てた出版物。 グリホサートの評価に直接関連するデータはありません（作物の組成分析、遺伝子流動、タンパク質の特性評価など） ⑧グリホサートまたは関連する代謝物が焦点ではなかった論文 ⑨科学的および規制上のレビューを含む二次情報 ⑩政治的/社会的/経済的分析を扱った記事

⑪化合物の混合物/潜在的に原因となる要因によって引き起こされ、したがって懸念物質（混合物の毒性など）に起因しない観察
⑫欧州の規制目的に関係のない試験デザイン、試験システム、試験種、暴露経路など
⑬生態毒性学、毒物学、残留物、および環境運命に関連しない所見
⑭欧州の代表的な用途/条件を扱っていない出版物（例：圃場の場所、土壌の特性、欧州以外のモニタリングなど）
⑮AIR5 ドシエの代表的な処方ではなく、したがって欧州でのグリホサートの更新に関連しないラウンドアップ処方/その他のグリホサート処方を扱っている出版物
⑯一般的な農薬曝露を扱った出版物（グリホサートに固有ではないもの）
⑰欧州レベルの規制リスク評価に関連しないエンドポイントを生成する出版物（例：酵素、細胞および分子レベルなどに基づく所見）
⑱欧州の規制リスク評価に使用できる新しいデータが提供されていない意見記事

評価目的との適合性（第２段階）で設定した判断基準

第２段階：文献の全文に基づく適合性評価（DA）

第１段階で除外した以外の公表文献については、文献全文の内容に基づいて、以下の手順に従って評価目的との適合性を検証し、その結果により分類した。

（ア）評価の目的と適合しない文献の除外

文献全文の内容に基づき、第１段階と同様に下記の①から⑱に該当するものは評価の目的と適合しない文献と見なし、その論文リストと判断理由を英文報告書 p.55-77 の Table 29 に示した。

①有効性（耐性関連の記事、害虫/作物の防除の新しい使用法）または農業/生物学研究（作物科学、育種、施肥、耕作、基本的な植物生理学/ミクロ/分子生物学）に関連する出版物
②分析方法/開発を扱った出版物
③新しい合成方法（発見/開発）または基本的な（有機/無機）化学の他の側面を説明する出版物
④特許に関するもの
⑤廃水処理に関するもの
⑥規制リスク評価のための十分なデータ/情報を含まない会議の貢献に言及する要約
⑦遺伝子組み換え生物/トランスジェニック作物に焦点を当てた出版物。 グリホサートの評価に直接関連するデータはありません（作物の組成分析、遺伝子流動、タンパク質の特性評価など）
⑧グリホサートまたは関連する代謝物が出版物の焦点ではなかった出版物
⑨科学的および規制上のレビューを含む二次情報
⑩政治的/社会的/経済的分析を扱った記事
⑪化合物の混合物/潜在的に原因となる要因によって引き起こされ、したがって懸念物質（混合物の毒性など）に起因しない観察
⑫欧州の規制目的に関係のない試験デザイン、試験システム、試験種、暴露経路など
⑬生態毒性学、毒物学、残留物、および環境運命に関連しない所見
⑭欧州の代表的な用途/条件を扱っていない出版物（例：圃場の場所、土壌の特性、欧州以外のモニタリングなど）
⑮AIR5 ドシエの代表的な処方ではなく、したがって欧州でのグリホサートの更新に関連しないラウンドアップ処方/その他のグリホサート処方を扱っている出版物
⑯一般的な農薬曝露を扱った出版物（グリホサートに固有ではないもの）
⑰欧州レベルの規制リスク評価に関連しないエンドポイントを生成する出版物（例：酵素、細胞および分子レベルなどに基づく所見）
⑱欧州の規制リスク評価に使用できる新しいデータが提供されていない意見記事

グリホサートによる健康被害と曝露に関する論文に対する追加基準

グリホサートの健康影響に関する科学文献は、大きく２つに分けられる。

- グリホサート酸と塩および基準グリホサート製剤 MON 52276 に関するデータを含む論文、

および

- 基準製剤 MON 52276 とは異なる組成を持つグリホサート製剤および／または共配合剤に関するデータのみを含む論文。

グリホサート製剤にのみ関連する論文の場合、全身曝露の結果としての健康影響を評価するための製剤の in vitro 試験は、細胞膜とミトコンドリア膜の不安定化に基づく細胞毒性を生み出す界面活性剤が存在することによりグリホサート特有の毒性を覆い隠してしまうため、除外した。

また、グリホサート濃度が 1 mM を超える in vitro の結果のみが提示されている場合、これらの論文は全身毒性に関する評価には関連性がなく、信頼性がないと判断された。これは、in vivo 試験系におけるグリホサートの経口バイオアベイラビリティが限られており（約 20%）、経皮吸収が非常に低く、全身への排泄が速いため、標準的な規制対象の in vivo 試験でその濃度を達成することは生理学的に不可能であるためです。

1 mM の限界値は、グリホサート 71.7%w/w を含む製剤の単回経口薬物動態データに基づいており、ラットに 1,430 mg/kg bw を経口投与すると、2 時間後の血漿濃度は 38.1 μg/mL あるいは 0.225 mM となる。線形に外挿すると（グリホサートは肝代謝を受けないので可能）、2,000 mg/kg bw を経口摂取後 2 時間で 53.3 μg/mL または 0.315 mM、4,000 mg/kg bw を経口摂取後 2 時間で 107 μg/mL または 0.630 mM という血漿濃度となる。グリホサートの全身濃度 1 mM は 6,000 mg/kg bw を超える経口投与に相当し、現在の OECD 試験ガイドラインに基づく反復投与実験 in vivo 試験には全く不適当です。グリホサートの ADI 0.5 mg/kg bw/day は、グリホサートの経口バイオアベイラビリティを 20%として、体重 60 kg、細胞外液 36 L のヒトの一日全身濃度を 0.17 μg/mL または 1 μM と見なすことができる。米国におけるグリホサート施用者の尿中幾何平均値 3.2 μg/L に基づく施用日（すなわち最高暴露日）のグリホサートの一日全身量は約 0.0001 mg/kg bw/day であり（Acquavella, 2004）、経口バイオアベイラビリティ 20%の ADI 0.5 mg/kg bw の全身量（0.1 mg/kg bw）より 1000 倍も少ない。

グリホサートのリスク評価に関連すると考えられ、全文ベースで信頼性が評価された多くの論文には、グリホサートに加え、（MON 52276 とは異なる）製剤や共配合剤に関する実験データも含まれている。このような場合、グリホサートと参照製剤（論文の著者が明確に述べている場合）に関連する毒性データのみを要約し、議論している。曝露モニタリングと疫学に関する論文の場合は、グリホサート製剤への曝露を考慮する。

（イ）評価の目的と適合した文献の分類

（ア）で除外した以外の文献については、適合性があると判断した文献とし、EFSA2092 ガイダンス文書-EFSA ジャーナル 2011;9（2）：2092、ポイント 5.4.1 で推奨されているように分類された。

分類区分

区分	該当する文献
A	リスク評価パラメータの設定または精緻化のためのデータを提供する研究。
B	データ要件に関連するが、申請者の意見では、既存のリスク評価パラメータを変更しない補足情報のみ を提供する研究
C	関連性が明確に判断できない研究。

結果の信頼性に基づく分類

評価目的への適合性評価において「区分 A」に分類した文献については表 16 - 18 に示した判断基準に従って信頼性を評価した。信頼できないと分類されたカテゴリーA の文献は、カテゴリーB に格下げされた。

表 16：生態毒性、環境運命、残留に関する信頼性基準（英文報告書 p.19-21 Table 13）

適用	信頼性基準
Ecotoxicology, Environmental Fate, Residues	ガイドラインに準拠した試験（GLP試験）の場合：OECD、OPPTS、ISO、その他。対応するガイドラインに記載されている妥当性・品質基準を満たす。
Ecotoxicology, Environmental Fate, Residues	他の化学物質への以前の暴露の有無が記録されている（関連する場合）
Ecotoxicology	水生試験においては、被験物質を水に溶かすか、溶媒が必要な場合は適切なもの（非毒性）で、溶媒対照／陽性対照を試験計画に考慮する。
Environmental Fate, Residues	試験物質は水または無毒の溶媒に溶解する。
Ecotoxicology, Environmental Fate, Residues	被験物質について十分に文書化され、報告されていること（純度、供給源、含有量、保管条件など)。
Ecotoxicology	脊椎動物を含む試験については、毒性試験に使用されたバッチの原体規格との適合性。
Ecotoxicology	実験に供した種については、入手源、実験条件（関連する場合)：系統、齢／ライフステージ、体重、順化、温度、pH、酸素（水生実験では溶存酸素）含有量、飼育環境、光条件、湿度（陸生種)、培養条件、餌を含めて明確に報告されていること。
Ecotoxicology	関連する試験ガイドラインの妥当性基準は、異なる種間で外挿することができるが、必ずしも 異なる試験デザイン間で外挿する必要はない。異なる場合、その違いの性質と影響について議論することが理想的である。
Ecotoxicology, Environmental Fate, Residues	グリホサートまたはその代謝物のみを被験物質とし（混合物を除く)、被験物質の適用に関する情報が記載されている。
Ecotoxicology, Environmental Fate, Residues	測定されたエンドポイントは、グリホサート（またはグリホサート代謝物）の影響と考えることができる。
Ecotoxicology, Environmental Fate, Residues	試験計画／試験系がよく記述されており、関連する場合は、曝露媒体中の濃度（投与率、適用量など)、被験物質（溶媒、ビヒクル）の希釈／混合が含まれています。
Ecotoxicology, Environmental Fate, Residues	試験媒体（濃度）/採取した試料で実施した分析の検証、試験媒体中の被験物質の安定性を記載すること。
Ecotoxicology	試験は、関連する場合は陽性／陰性対照を含むいくつかの用量レベル（少なくとも 3 つ）で実施されています。
Ecotoxicology	全期間を通して適切な露出が実証され、報告された。
Ecotoxicology	用量反応試験デザインを採用した試験において、明確な濃度反応関係が報告されている。
Ecotoxicology	統計解析を容易にするために、1群につき十分な数の動物が報告されている：対照群における死亡率、陽性/陰性対照における観察/所見を明確に報告されている（関連する場合）。
Ecotoxicology, Environmental Fate, Residues	報告されたデータにより、アッセイの統計的検出力を評価することが可能である。
Ecotoxicology, Environmental Fate, Residues	統計手法が報告されている（プロットや信頼区間の確認など）
Ecotoxicology	観察（時間を含む)、検査、解析の実施内容、(関連する場合）解剖が十分軌陸されている
Ecotoxicology	実験室や野外での陸上生態毒性試験では、使用する基質（葉の種類や土壌の種類など）を適切に説明する必要がある。
Ecotoxicology, Environmental Fate, Residues	欧州の状況に関連する/比較可能なフィールドロケーション。

適用	信頼性基準
Ecotoxicology, Environmental Fate, Residues	土壌の特性：テクスチャー（砂質ローム、シルト質ローム、ローム、ローム状砂）、pH（5.5-8.0）、陽イオン交換容量、有機炭素（0.5-2-5%）、かさ密度、保水性、微生物バイオマス（有機炭素 1%以下）。
Ecotoxicology, Environmental Fate	その他の土壌については、pH、テクスチャー、CEC、有機炭素、かさ密度、保水力、微生物バイオマスなどのパラメータによる特性評価に関する情報が提供されている。
Ecotoxicology, Environmental Fate, Residues	農地土壌を含む試験の場合、最低 1 年間は被験物質または類似の物質で処理されていないことが望ましい。
Ecotoxicology, Environmental Fate	土壌サンプルは、A-horizon の最上部 20 cm の層から採取し、現場からの新鮮な土壌が望ましい（4 +/- 2°Cで最大 3 ヶ月保管）。
Ecotoxicology, Environmental Fate, Residues	降水量に関するデータを記録
Environmental Fate	温度は 20〜25℃の範囲で、水分は報告されている。
Environmental Fate	欧州の地下水、土壌、地表水、堆積物、大気から採取されたサンプルにグリホサートの存在が確認された。
Ecotoxicology	実験室での陸上試験では、温度は試験対象種に適したもので、一般に 20〜25℃の範囲に収まるべきであり、土壌水分/相対湿度が報告されている。
Ecotoxicology	蜂の試験については、試験の温度は種に適したものであるべきである。
Ecotoxicology	実験室での水生生物試験：
	使用され媒体の入手元や組成が記載されていること。
	水温はテストする生物種に適したもので、一般的に 15〜25℃の範囲に収まるようにします。
Ecotoxicology, Residues	残留データは、グリホサートの承認更新の状況に応じて文脈で適切な、明確に記述された GAP 表（作物、適用方法、投与量、間隔、PHI）にリンクさせることができる。
Ecotoxicology, Environmental Fate, Residues	分析結果は、グリホサートおよびその代謝物に関する既存の残留性定義と関連づけることができる残留物の測定値を示す。
Ecotoxicology, Environmental Fate, Residues	分析方法が明確に記述されており、分析方法の特異性、感度が適切に記述されている。
Ecotoxicology	中央値付近の信頼区間の幅に対する ECX の評価と、ECX の中央値が提供する保護レベルの確実性が報告される。
Environmental Fate	放射性標識の特性：純度、比活性、標識の位置が報告されている。
Environmental Fate	分解キネティクスが含まれる場合：データテーブル／モデル説明／動態適合のための統計パラメータを提供すること。
Environmental Fate, Residues	モニタリングデータ：分析されたマトリックスの説明、および分析方法を完全に記述すること。
Environmental Fate	適用量および承認された用途との関連性を明確に記述すること。
総合評価： 信頼できる ／ 制約があるが信頼できる ／ 信頼できない	

表 17：毒性学 - 疫学と暴露試験に関する信頼性基準（英文報告書 p.22 Table 14）

疫学試験	暴露試験
ガイドラインに準拠	**ガイドラインに準拠**
国際的に認められた有効な試験ガイドライン/プラクティスに従った試験	国際的に認められた有効な試験ガイドライン/プラクティスに従った試験
試験は完全に記述され、科学的に許容される基準に従って実施された。	GLP に準拠して実施された試験
	試験は完全に記述され、科学的に許容される基準に従って実施された。
被験物質	**被験物質**
グリホサートのみをa.i.とした製剤への曝露。	グリホサートのみを a.i.とした製剤への曝露。
グリホサートと他のa.i.を併用した製剤への曝露。	グリホサートと他の a.i.を併用した製剤への曝露。
様々な製剤の農薬に暴露される。	様々な製剤の農薬に暴露される。
試験	**試験**
試験デザイン - 疫学的手法に準拠	試験デザインの明確な記述
調査対象者（集団）を記述	調査した母集団が十分に記述されている
暴露状況について記述	暴露の状況を十分に説明する
結果の記述	サンプリングスキームが十分に文書化されている
交絡因子は考慮されているか	分析方法の詳細が記述されている
統計解析	報告された分析法の妥当性確認
	モニタリング結果の報告
総合評価： 信頼できる ／ 制約があるが信頼できる ／ 信頼できない	

表 18：毒性学 - ***in vitro* and *in vivo*** 試験に関する信頼性基準（英文報告書 p.23 Table 15）

信頼性基準 - 毒性・代謝	
***in vitro* 試験**	***in vivo* 試験**
ガイドラインに準拠	**ガイドラインに準拠**
国際的に認められた有効な試験ガイドラインに従った試験	国際的に認められた有効な試験ガイドラインに従った試験
GLP に準拠して実施された試験	GLP に準拠して実施された試験
研究は完全に記述され、科学的に許容される基準に従って実施された。	研究は完全に記述され、科学的に許容される基準に従って実施された。
被験物質	**被験物質**
被験物質（グリホサート）について十分に記述され、報告されていること（純度、供給源、含有量、保管条件など）。	被験物質（グリホサート）について十分に記述され、報告されていること（純度、供給源、含有量、保管条件など）。
グリホサート酸またはその塩のみが被検物質である	グリホサート酸またはその塩のみが被検物質である
AMPA は被検物質	AMPA は被検物質
試験	**試験**
試験系が明確かつ完全に記述されている	試験系が明確かつ完全に記述されている
試験条件が明確かつ完全に記述されている	試験条件が明確かつ完全に記述されている
代謝活性化システムが明確に完全に記述されている	投与経路・投与方法が記載されている
生理額的に許容される範囲の試験濃度（< 1 mM）である	投与量が報告されている
細胞毒性試験の報告	用量レベルごとに使用した動物数の報告
陽性及び陰性対照	分析試験媒体の分析方法について記載
観察された影響の完全な報告	分析法の妥当性確認
統計手法の記述	試験媒体の分析検証
陰性及び陽性対照の背景データの報告	観察された影響の完全な報告
用量相関の報告	統計手法の記述
	試験施設の背景データの報告
総合評価： 信頼できる ／ 制約があるが信頼できる ／ 信頼できない	

4．検索結果のまとめ

表 19 検索結果のまとめ ― すべての論文（英文報告書 p.24 Table 16）

	論文数
対象とする農薬名で検索抽出した総論文数（全データベースの合計）	9947
手動で重複を削除した後の総論文数	3294
迅速な評価（タイトル・要旨）の結果、除外された論文の数	3050
詳細な評価を行った総論文数	244
詳細な評価の結果、除外された論文数（例：関連性がない）	166
詳細な評価の結果、除外されなかった論文の数[a)]	78

a ：関連性カテゴリーA、B、C（EFSA Journal 2011;9(2):2092, Point 5.4.1 による）に属する全文関連論文

表 20 適合性評価第 2 段階で適合性ありとされた文献と分類結果（英文報告書 p.6 Table 2）

分野	該当する論文数		
	区分 A	区分 B	区分 C
毒性	6	19	6
残留	0	1	0
環境毒性	7	22	1
環境動態	0	16	0
薬効/農学	0	0	0
計	13	58	7

表 21 検索結果のまとめ— 環境毒性に関する論文（英文報告書 p.24 Table 17 から抜粋）

	論文数
手動で重複を削除した後の総論文数	123
迅速な評価（タイトル・要旨）の結果、除外された論文の数	24
詳細な評価を行った総論文数	99
詳細な評価の結果、除外された論文数（例：関連性がない）	69
詳細な評価の結果、除外されなかった論文の数 a)	30

a ：関連性カテゴリーA、B、C（EFSA Journal 2011;9(2):2092, Point 5.4.1 による）に属する全文関連論文

表 22 検索結果のまとめ— 環境動態に関する論文（英文報告書 p.24 Table 18 から抜粋）

	論文数
手動で重複を削除した後の総論文数	80
迅速な評価（タイトル・要旨）の結果、除外された論文の数	18
詳細な評価を行った総論文数	65
詳細な評価の結果、除外された論文数（例：関連性がない）	49
詳細な評価の結果、除外されなかった論文の数 a)	16

a ：関連性カテゴリーA、B、C（EFSA Journal 2011;9(2):2092, Point 5.4.1 による）に属する全文関連論文

表 23 検索結果のまとめ— 残留に関する論文（英文報告書 p.25 Table 19 から抜粋）

	論文数
手動で重複を削除した後の総論文数	13
迅速な評価（タイトル・要旨）の結果、除外された論文の数	12
詳細な評価を行った総論文数	1
詳細な評価の結果、除外された論文数（例：関連性がない）	0
詳細な評価の結果、除外されなかった論文の数 a)	1

a ：関連性カテゴリーA、B、C（EFSA Journal 2011;9(2):2092, Point 5.4.1 による）に属する全文関連論文

表 24 検索結果のまとめ— 毒性に関する論文（英文報告書 p.25 Table 20 から抜粋）

	論文数
手動で重複を削除した後の総論文数	106
迅速な評価（タイトル・要旨）の結果、除外された論文の数	30
詳細な評価を行った総論文数	76
詳細な評価の結果、除外された論文数（例：関連性がない）	45
詳細な評価の結果、除外されなかった論文の数 a)	31

a ：関連性カテゴリーA、B、C（EFSA Journal 2011;9(2):2092, Point 5.4.1 による）に属する全文関連論文

表 25 検索結果のまとめ― 薬効／農学に関する論文（英文報告書 p.25 Table 21 から抜粋）

	論文数
手動で重複を削除した後の総論文数	2
迅速な評価（タイトル・要旨）の結果、除外された論文の数	0
詳細な評価を行った総論文数	2
詳細な評価の結果、除外された論文数（例：関連性がない）	2
詳細な評価の結果、除外されなかった論文の数 [a)]	0

a ：関連性カテゴリーA、B、C（EFSA Journal 2011;9(2):2092, Point 5.4.1 による）に属する全文関連論文

表 26 検索結果のまとめ― その他の関連性のないカテゴリーに関する論文

（英文報告書 p.26 Table 22 から抜粋）

	論文数
手動で重複を削除した後の総論文数	2967
迅速な評価（タイトル・要旨）の結果、除外された論文の数	2966
詳細な評価を行った総論文数	1
詳細な評価の結果、除外された論文数（例：関連性がない）	1
詳細な評価の結果、除外されなかった論文の数 [a)]	0

a ：関連性カテゴリーA、B、C（EFSA Journal 2011;9(2):2092, Point 5.4.1 による）に属する全文関連論文

5. 適合性評価の第２段階で「適合しない」と判断した論文リストとその理由

表 27 適合性評価の第２段階で「適合しない」と判断した論文とその理由 （英文報告書 p.55-77 の Table 29）

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
2690		Hunter	2008	Spare part nightmare	Farmers Weekly. Vol. 149, no. 8, pp. 59-59. 22 Aug. 2008	Farmers Weekly is not a peer-reviewed journal. No abstract nor full text available. According to the title, it is related to spare parts, not relevant for the risk assessment.
1914	Ecotoxicology (incl. pollen/nectar residue)	Aliferis et al.	2009	Lemna minor L. as a model organism for ecotoxicological studies performing 1H NMR fingerprinting.	Chemosphere, (2009 Aug) Vol. 76, No. 7, pp. 967-73	This study presents findings regarding metabolics and therefore only based on cellular and molecular level that cannot be related to the risk assessment.
253	Ecotoxicology (incl. pollen/nectar residue)	Amoros et al.	2007	Assessment of toxicity of a glyphosate - based formulation using bacterial systems in lake water .	Chemosphere, (2007 May) Vol. 67, No. 11, pp. 2221-8	The Roundup formulation used in the study contains POEA surfactant which is permitted in formulated herbicidal products in the EU / Japan. Analytical verifications of the test item concentrations were conducted but no detailed results were reported. Results are reported in diagrams, but no numerical results are presented for the treatments
69	Ecotoxicology (incl. pollen/nectar residue)	Bautista	2007	A summary of acute risk of four common herbicides to birds and mammals .	U S Forest Service Pacific Northwest Research Station General Technical Report PNW-GTR, (JUN 2007) No. 694, pp. 77-82	In this publication risk assessments for birds and mammals are conducted on the basis of available endpoints from other publications. No new data for the RA is provided.
3020	Ecotoxicology (incl. pollen/nectar residue)	Bernal et al.	2009	Toxicity of formulated glyphosate (glyphos) and cosmo-flux to larval Colombian frogs 1. Laboratory acute toxicity.	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 961-5	In this article the observations were caused by a mixture of compounds (a mixture of formulated glyphosate -Glyphos- and the adjuvant Cosmo-Flux) and thus not attributable to glyphosate alone (e.g. mixture toxicity). In addition, the tested glyphosate formulation is not the representative formulation for the AIR5 dossier and thus not relevant to the EU /Japan glyphosate renewal. It probably contains the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. All tested individuals were taken from natural sources with an unknown history of previous chemical applications.
3021	Ecotoxicology (incl. pollen/nectar residue)	Bernal et al.	2009	Toxicity of formulated glyphosate (glyphos) and cosmo-flux to larval and juvenile colombian frogs 2. Field and laboratory microcosm acute toxicity .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 966-73	In this article the observations were caused by a mixture of compounds (a mixture of formulated glyphosate -Glyphos- and the adjuvant Cosmo-Flux) and thus not attributable to glyphosate alone (e.g. mixture toxicity). In addition, the tested glyphosate

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
						formulation is not the representative formulation for the AIR5 dossier and thus not relevant to the EU /Japan glyphosate renewal. It probably contains the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. All tested individuals were taken from natural sources with an unknown history of previous chemical applications. Furthermore, this field study does not deal with EU / Japan representative uses / conditions (e.g. field locations, water properties, specific climatic conditions, etc.).
2205	Ecotoxicology (incl. pollen/nectar residue)	Brausch et al.	2006	Pesticide usage on the Southern High Plains and acute toxicity of four chemicals to the fairy shrimp Thamnocephalus platyurus (crustacea: anostraca).	Tex. J. Sci., Vol. 58, Issue 4, Page 309-324, Publication Year 2006	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
999	Ecotoxicology (incl. pollen/nectar residue)	Bueno et al.	2008	Effects of pesticides used in soybean crops to the egg parasitoid Trichogramma pretiosum.	Ciencia Rural, (SEP 2008) Vol. 38, No. 6, pp. 1495-1503	This publication is dealing with formulations (Roundup Ready®, Roundup Transorb®, Roundup Original®, Gliz®) that are not the representative formulations for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. They probably contain the surfactant POEA or a similar one, which is not permitted in formulated herbicidal products in the EU / Japan?.
1646	Ecotoxicology (incl. pollen/nectar residue)	Bushaiba et al.	2006	Impact of chemical pesticides on survival and feeding rate of the woodlouse Porcellio scaber (Isopoda, Oniscidea) in Benghazi, Libya.	Jordan Journal of Applied Science (Natural Sciences) (2006) , Vol. 8, No. 2, pp. 43-50	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan.
775	Ecotoxicology (incl. pollen/nectar residue)	Casabe et al.	2007	Ecotoxicological assessment of the effects of glyphosate and chlorpyrifos in an Argentine soya field	Journal of soils and sediments (2007) , Vol. 7, No. 4, pp. 232-239	The field phase of this publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in soya fields under open-air conditions in Argentina). In addition, the study was conducted with a Roundup formulation (Roundup FG), probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
1334	Ecotoxicology (incl. pollen/nectar residue)	Cavalcante et al.	2008	Genotoxic effects of Roundup on the fish Prochilodus lineatus.	Mutation research, (2008 Aug-Sep) Vol. 655, No. 1-2, pp. 41-6.	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the findings are only based on cellular and molecular level that cannot be related to the risk assessment.
631	Ecotoxicology (incl. pollen/nectar residue)	Cavas et al.	2007	Detection of cytogenetic and DNA damage in peripheral erythrocytes of goldfish (Carassius auratus) exposed to a glyphosate formulation using the micronucleus test and the comet assay.	Mutagenesis, (2007 Jul) Vol. 22, No. 4, pp. 263-8	This publication is dealing with a Roundup formulation containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the findings are based on cellular and molecular level (analysis of micronuclei and other nuclear abnormalities and a comet assay) that cannot be related to the risk assessment.
2944	Ecotoxicology (incl. pollen/nectar residue)	Cedergreen et al.	2006	The occurrence of hormesis in plants and algae .	Dose-response : a publication of International Hormesis Society, (2006 Oct 17) Vol. 5, No. 2, pp. 150-62	In this publication the frequency, magnitude and dose/concentration range of hormesis of one algal and three plant species after expsoure to glyphosate and other pesticides was investigated. Therefore available dose-response curves from other publications were taken into account. As no new experimental data was generated and the findings cannot be related to the risk assessment this publication is regarded to be not relevant.
2439	Ecotoxicology (incl. pollen/nectar residue)	Cedergreen et al.	2007	Reproducibility of binary-mixture toxicity studies.	Environmental Toxicology and Chemistry (2007) , Vol. 26, No. 1, pp. 149-156	The observations presented in this study were caused by mixture of different herbicides and thus not attributable to glyphosate itself (e.g. mixture toxicity). Glyphosate alone data (EC50) were also calculated for Lemna minor, but no data/values were given, just graphical representations. For Tripleurospernum indorum, a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan, was used. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.

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1872	Ecotoxicology (incl. pollen/nectar residue)	Cedergreen et al.	2007	Is mixture toxicity measured on a biomarker indicative of what happens on a population level? A study with Lemna minor.	Ecotoxicology and Environmental Safety, (JUL 2007) Vol. 67, No. 3, pp. 323-332	The observations presented in this study were caused by mixture of different herbicides and thus not attributable to glyphosate itself (e.g. mixture toxicity). Glyphosate alone data were calculated (mean growth and mean pigment EC50 for Lemna minor), but no data/values were given, just graphical representations.
567	Ecotoxicology (incl. pollen/nectar residue)	Cericato et al.	2008	Cortisol response to acute stress in jundia Rhamdia quelen acutely exposed to sub-lethal concentrations of agrichemicals	Comparative Biochemistry and Physiology, Part C: Toxicology and Pharmacology (2008), 148C(3), 281-286	This publication is dealing with a Roundup formulation containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the findings are based on molecular level (cortisol in plasma) that cannot be related to the risk assessment.
1785	Ecotoxicology (incl. pollen/nectar residue)	Chattopadhyay et al.	2007	Influences of environmental factors and antidote addition on glyphosate toxicity to freshwater fish , Labeo rohita (Hamilton)	Chemistry and Ecology [Chem. Ecol.]. Vol. 23, no. 4, pp. 279-287. Aug 2007	This publication deals with the Glycel® formulation, containing ethoxylated tallow alkyl amines surfactant, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, most observations are addressing the effects of a mixture of potentially causal factors (pH, calcium, salinity) and thus not fully attributable to glyphosate itself. The exposure time of the fish to the fresh or aged residues of glyphosate in water is not given and the applied concentration is not clear (12.3 L a.i/ha/m).
99	Ecotoxicology (incl. pollen/nectar residue)	Comstock et al.	2007	Actue toxic effects of round-up herbicide on wood frog tadpoles (Rana sylvatica).	Journal of Freshwater Ecology, (DEC 2007) Vol. 22, No. 4, pp. 705-708	The Roundup formulation used in the study contains POEA surfactant which is permitted in formulated herbicidal products in the EU / Japan. No analytical verifications of the test item concentrations in the test media were conducted. No replicates were used for the study design and study conditions are not described (pH, temperature, oxygen content, water quality parameters, feeding)
2158	Ecotoxicology (incl. pollen/nectar residue)	Costa et al.	2008	Oxidative stress biomarkers and heart function in bullfrog tadpoles exposed to Roundup Original.	Ecotoxicology (London, England), (2008 Apr) Vol. 17, No. 3, pp. 153-63	This publication deals with a Roundup formulation, containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
						products in the EU / Japan.
3019	Ecotoxicology (incl. pollen/nectar residue)	Dinehart et al.	2009	Toxicity of a glufosinate- and several glyphosate-based herbicides to juvenile amphibians from the Southern High Plains, USA.	Sci. Total Environ., Vol. 407, Issue 3, Page 1065-1071, Publication Year 2009	This publication is dealing with Roundup formulations containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan or in a mixture together with pelargonic acid. These are not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the individuals were taken from natural sources and the specific exposure history of the populations from which animals used in this study were drawn is unknown. These amphibian populations likely experienced previous pesticide exposure because they were inhabiting wetlands surrounded by agriculture.
904	Ecotoxicology (incl. pollen/nectar residue)	Elandalloussi et al.	2008	Effect of the herbicide Roundup on Perkinsus olseni in vitro proliferation and in vivo survival when infecting a permissive host, the clam Ruditapes decussatus.	Bulletin of environmental contamination and toxicology, (2008 Jun) Vol. 80, No. 6, pp. 512-5	In this study the active substance glyphosate and a Roundup formulation containing POEA surfactant is tested. The study results determined for the active substance glyphosate are very limited, i.e. for the parasitic protozoa Perkinsus olseni the in vitro inhibition of growth was tested and one IC50 value without confidence intervals is presented. For the Roundup formulation and the active substance glyphosate no analytical verifcations of test item concentrations were conducted. As the surfactant POEA is not permitted in formulated products in the EU/Japan the determined study results for the Roundup-formulation are not regarded relevant. The study results for the active substance glyphosate are also not regarded relevant, as no analytical verification of the test concentrations were conducted, the results are very limited and the test species and test design is not regarded adequate to assess ecotoxicological relevant endpoints for the risk assessment.
1600	Ecotoxicology (incl. pollen/nectar residue)	El-Shenawy et al.	2009	Histopathologic Biomarker Response of Clam, Ruditapes decussates, to Organophosphorous Pesticides Reldan and Roundup: A Laboratory Study.	Ocean Science Journal, (MAR 2009) Vol. 44, No. 1, pp. 27-34	This publication does not provide any numerical/graphical result, just digital images of histopathological changes without any measure of these changes and no relation with related chronic toxicological effects. In addition, this publication is dealing with a Roundup formulation most probably

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						containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan.
2627	Ecotoxicology (incl. pollen/nectar residue)	Fell et al.	2006	Short-term effects on macroinvertebrates and fishes of herbiciding and mowing Phragmites australis-dominated tidal marsh.	Northeastern Naturalist, (2006) Vol. 13, No. 2, pp. 191-212	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the field survey was conducted in 50 ha of marshland in US). In addition, it deals with a Rodeo formulation in combination with the aquatic surfactant Chem Surf. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. The observations are also caused by a mixture of potentially causal factors and thus not only attributable to glyphosate.
342	Ecotoxicology (incl. pollen/nectar residue)	Glazko et al.	2006	Change in the enzyme spectra of soil microorganisms Micrococcus luteus CCM 248 and Stenotrophomonas maltophilia UKM V-257 under the effect of certain pesticides.	Russian Agricultural Sciences (2006) , No. 5, pp. 8-12, translated from Doklady Rossiiskoi Akademii Selskokhozyaistvennykh Nauk (2006) No. 3, 27-30 (Ru)	In this literature article the effect of Roundup and other pesticides on the synthesis of enzymes in M. luteus CCM 248 and S. maltophilia UKM V-257 is examined. As the findings are based on molecular level, they cannot be related to the risk assessment.
104	Ecotoxicology (incl. pollen/nectar residue)	Glusczak et al.	2007	Acute effects of glyphosate herbicide on metabolic and enzymatic parameters of silver catfish (Rhamdia quelen).	Comparative biochemistry and physiology. Toxicology and pharmacology : CBP, (2007 Nov) Vol. 146, No. 4, pp. 519-24	The Roundup formulation used in the study contains POEA surfactant which is permitted in formulated herbicidal products in the EU/Japan. In addition in the study the effects of Roundup on metabolic and enzymatic parameters of silver catfish were assessed. As the findings are only based on molecular level they cannot be related to the risk assessment.
832	Ecotoxicology (incl. pollen/nectar residue)	Glusczak et al.	2006	Effect of glyphosate herbicide on acetylcholinesterase activity and metabolic and hematological parameters in piava (Leporinus obtusidens).	Ecotoxicology and Environmental Safety, (OCT 2006) Vol. 65, No. 2, pp. 237-241	In this literature article the effects of Roundup on acethycholinesterase and hematological parameters in Leporinus obtusidens were assessed. As the findings are only based on molecular level they cannot be related to the risk assessment.
2996	Ecotoxicology (incl. pollen/nectar residue)	Guilherme et al.	2009	Tissue specific DNA damage in the European eel (Anguilla anguilla) following a short-term exposure to a glyphosate -based herbicide	Toxicology Letters [Toxicol. Lett.]. Vol. 189, S212 p. 13 Sep 2009	This abstract refers to the 46th Congress of the European Societies of Toxicology. Tissue specific DNA damage in the European eel following a short-term exposure to a glyphosate based herbicide is the topic under investigation. As no detailed information is provided and the findings are only based on molecular level, they cannot be related to the risk assessment.
2969	Ecotoxicology (incl.	Guiseppe	2006	The use of glyphosate herbicides in	(2006) , Electronic Series Title:	Scientific review of existing literature.

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	pollen/nectar residue)			managed forest ecosystems and their effects on non-target organisms with particular reference to ants as bioindicators	Technical bulletin (Maine Agricultural and Forest Experiment Station) ; 192	
348	Ecotoxicology (incl. pollen/nectar residue)	Gupta et al.	2009	Changes in microbial biomass and phosphatase activity exposed to 2,4-D and glyphosate	Journal of Environmental Research and Development (2009), 3(3), 663-669	The study focuses on the effects of glyphosate on the phosphatase enzyme, biomass carbon and phosphorous in soil. These parameters are not considered relevant for the EU / Japanese risk assessment. In addition, test soils originate from cultivated land from North India and might therefore not be regarded representative for the EU/Japan.
903	Ecotoxicology (incl. pollen/nectar residue)	Jankowska et al.	2007	Effect of the herbicide ROUNDUP 360 SL on the generation time of Aeromonas hydrophila and Pseudomonas fluorescens in lake water .	Polish Journal of Natural Sciences (2007) , Vol. 22, No. 4, pp. 660-669	This publication is dealing with effects of the representative EU formulation (Roundup 360 SL) on the generation time of the aquatic bacteria Aeromonas hydrophila and Pseudomonas fluorescens. No further endpoints were assessed and no anayltical verification of the test item concentrations were conducted. As the evaluated endpoint is is not regarded relatable to the risk assessment, the study was considered as not relevant.
845	Ecotoxicology (incl. pollen/nectar residue)	Kamble et al.	2006	Effect of herbicide glyphosate on DNA , RNA and protein contents of seedlings of Hibiscus cannabinus Linn.	Biosciences Biotechnology Research Asia, (December 2006) Vol. 3, No. 2 A, pp. 431-436	This publication is dealing with effects of glyphosate on macromolecular contents (DNA, RNA and protein) of treated Hibiscus seedlings. As the findings are based on molecular level they cannot be related to the risk assessment.
418	Ecotoxicology (incl. pollen/nectar residue)	Kramer et al.	2008	Comments on /Evaluation of estrogenic activities of aquatic herbicides and surfactants using a rainbow trout vitellogenin assay/.	Toxicological Sciences, (June 2008) Vol. 104, No. 1, pp. 228-230	This is a letter to the editor (i.e. an opinion article about another different study), where no new data for the RA is provided.
1439	Ecotoxicology (incl. pollen/nectar residue)	Kremer et al.	2009	Glyphosate and glyphosate - resistant crop interactions with rhizosphere microorganisms	European journal of agronomy (2009) , Vol. 31, No. 3, pp. 153-161	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in open-air fields in US under local soil and climate conditions). In addition, glyphosate specifications were not indicated (no details on the used formulation). This work does not present any numerical/tabulated result, just graphical outcomes.
1826	Ecotoxicology (incl. pollen/nectar residue)	Krzysko-Lupicka et al.	2008	Interactions between glyphosate and autochthonous soil fungi surviving in aqueous solution of glyphosate .	Chemosphere, (2008 Apr) Vol. 71, No. 7, pp. 1386-91	The tested material was not identified (just that N-Phosphonomethylglycine used in this study was obtained from commercial formulation by

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						precipitation from its aqueous solution with concentrated hydrochloric acid). In addition, the exposure route (10 grams soil samples were suspended in 90 ml of 1 mM glyphosate solution) is not clear (for how much time?) and seems to not be relevant for EU / Japan regulatory purposes.
1661	Ecotoxicology (incl. pollen/nectar residue)	Kumari et al.	2008	Impact of herbicide (glyphosate) on the biochemical components of the fish , Catla catla	Indian Journal of Environment and Ecoplanning, (2008) Vol. 15, No. 1-2, pp. 434-438	This publication deals with the Glycel® formulation, containing ethoxylated tallow alkyl amines surfactant, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, all findings of this study are based on cellular and molecular level that cannot be related to the risk assessment.
2649	Ecotoxicology (incl. pollen/nectar residue)	Lancaster et al.	2006	Soil Microbial Activity Is Affected by Roundup WeatherMax and Pesticides Applied to Cotton (Gossypium hirsutum)	Journal of agricultural and food chemistry (2006) , Vol. 54, No. 19, pp. 7221-7226, Electronic	The observations presented in this study were caused by mixture of different herbicides and thus not attributable to glyphosate itself (e.g. mixture toxicity). Glyphosate alone data were also provided (only graphically), but a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan, was used. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
429	Ecotoxicology (incl. pollen/nectar residue)	Lee et al.	2009	Comparative effects of the formulation of glyphosate - surfactant herbicides on hemodynamics in swine.	Clinical toxicology (Philadelphia, Pa.), (2009 Aug) Vol. 47, No. 7, pp. 651-8.	Reported results on hemodynamics and death in piglets are according to the publication depending on surfactants (including POEA) and thus not relevant for the risk assessment.
2656	Ecotoxicology (incl. pollen/nectar residue)	Lupwayi et al.	2007	Soil microbial biomass, functional diversity and enzyme activity in glyphosate - resistant wheat-canola rotations under low-disturbance direct seeding and conventional tillage	Soil biology and biochemistry (2007) , Vol. 39, No. 7, pp. 1418-1427	This publication focuses on genetically modified organisms / transgenic crops; no data are directly relevant to glyphosate evaluation. This field study was conducted at six sites on the Canadian prairies and therefore is not dealing with EU / Japan representative uses / conditions (e.g. field locations, soil properties, etc.). Furthermore, the glyphosate formulation used in this study was not identified (just the application rate) and was mixed with other chemicals and thus the observations are not attributable to glyphosate.

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2658	Ecotoxicology (incl. pollen/nectar residue)	Lupwayi et al.	2009	Soil microbial response to herbicides applied to glyphosate - resistant canola	Agriculture, ecosystems and environment (2009), Vol. 129, No. 1-3, pp. 171-176	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the field survey was conducted on different sites in Canada). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. Some of the treatments are also caused by a mixture of potentially causal factors / chemicals and thus not only attributable to glyphosate. No comparison to control is possible, because there was no control treatment without herbicide application. The study was conducted to compare a glyphosate-resistant canola system with alternative herbicides.
1935	Ecotoxicology (incl. pollen/nectar residue)	Lushchak et al.	2009	Low toxic herbicide Roundup induces mild oxidative stress in goldfish tissues.	Chemosphere, (2009 Aug) Vol. 76, No. 7, pp. 932-7	The glyphosate tested substance in this study is a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. The Roundup formulation is not known. The effects were assessed only at cellular and molecular level that cannot be related to the risk assessment.
109	Ecotoxicology (incl. pollen/nectar residue)	Mccomb et al.	2008	Acute toxic hazard evaluations of glyphosate herbicide on terrestrial vertebrates of the Oregon coast range.	Environmental science and pollution research international, (2008 May) Vol. 15, No. 3, pp. 266-72.	Non relevant route of exposure (i.p.) for mammals.
1612	Ecotoxicology (incl. pollen/nectar residue)	Michalkova et al.	2009	How glyphosate altered the behaviour of agrobiont spiders (Araneae: Lycosidae) and beetles (Coleoptera: Carabidae)	Biological control : theory and application in pest management (2009), Vol. 51, No. 3, pp. 444-449	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU/Japan glyphosate renewal. In addition, the study design, test system and exposure routes are not relevant for the EU / Japan regulatory purposes. Tested rate is not clear.
975	Ecotoxicology (incl. pollen/nectar residue)	Nakamura et al.	2008	Effects of glyphosate herbicide on soil and litter macro-arthropods in rainforest: Implications for forest restoration	Ecological management and restoration (2008), Vol. 9, No. 2, pp. 126-133	This publication is dealing with a "Roundup" formulation (Roundup® Bioactive) probably containing the surfactant POEA, which is not permitted in formulated herbicidal products in the

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						EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, this field study is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in rainforest fields under open-air conditions in Australia).
1602	Ecotoxicology (incl. pollen/nectar residue)	Olurin et al.	2006	Histopathological responses of the gill and liver tissues of Clarias gariepinus fingerlings to the herbicide, glyphosate .	African Journal of Biotechnology, (DEC 18 2006) Vol. 5, No. 24, pp. 2480-2487	This publication does not provide any numerical/graphical result, just digital images of histopathological changes without any measure of these changes and no relation with related chronic toxicological effects. In addition, this publication does not identify the tested formulation.
755	Ecotoxicology (incl. pollen/nectar residue)	Pelosi et al.	2009	Earthworm community in conventional, organic and direct seeding with living mulch cropping systems.	Agron. Sustainable Dev., Vol. 29, Issue 2, Page 287-295, Publication Year 2009	In this field study comparing different cropping systems for 3 years, the observations in the glyphosate treated plots are caused by a mixture of other compounds/potentially causal factors and thus not attributable to glyphosate itself. In addition, glyphosate specifications and application details and rate were not indicated.
971	Ecotoxicology (incl. pollen/nectar residue)	Pereira et al.	2008	Effects of glyphosate and endosulfan on soil microorganisms in soybean crop .	Planta Daninha (2008) , Vol. 26, No. 4, pp. 825-830	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in open-air field plots in Brazil under local soil and climate conditions). In addition, it only focuses on microbial respiration (CO2 acumulation), which is no longer a variable to consider for the EU / Japan risk assessment
1018	Ecotoxicology (incl. pollen/nectar residue)	Perez et al.	2007	Effects of the herbicide Roundup on freshwater microbial communities : a mesocosm study.	Ecological applications : a publication of the Ecological Society of America, (2007 Dec) Vol. 17, No. 8, pp. 2310-22	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in earthen ponds under open-air conditions in Argentina). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan?. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
3225	Ecotoxicology (incl. pollen/nectar residue)	Quaranta et al.	2009	Why amphibians are more sensitive than mammals to xenobiotics.	PloS one, (2009 Nov 04) Vol. 4, No. 11, pp. e7699. Electronic Publication Date: 4 Nov 2009	Findings of this publication, related to the permeability of frogs and pigs skin to different chemicals including glyphosate are not related to ecotoxicology. In this article glyphosate was not the

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
						focus of the study (it deals with general pesticide exposure) and its study design and test system are not relevant for ecotoxicological regulatory purposes
349	Ecotoxicology (incl. pollen/nectar residue)	Ratcliff et al.	2006	Changes in microbial community structure following herbicide (glyphosate) additions to forest soils	Applied soil ecology (2006) , Vol. 34, No. 2-3, pp. 114-124	This study on the effects of glyphosate on the structure of the microbial community in soil is not dealing with EU / Japan representative uses / conditions (e.g. soil was collected from two different ponderosa pine plantations in northern California). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
2966	Ecotoxicology (incl. pollen/nectar residue)	Relyea et al.	2009	The toxicity of Roundup Original Max to 13 species of larval amphibians .	Environmental toxicology and chemistry, (2009 Sep) Vol. 28, No. 9, pp. 2004-8	The Roundup Original Max® formulation used in the study probably contains POEA surfactant (or any similar) which is not permitted in formulated herbicidal products in the EU / Japan. In addition no analytical verification of the test item concentration in the test media was conducted.
1654	Ecotoxicology (incl. pollen/nectar residue)	Riaz et al.	2009	Impact of glyphosate and benzo[a]pyrene on the tolerance of mosquito larvae to chemical insecticides. Role of detoxification genes in response to xenobiotics.	Aquat. Toxicol., Vol. 93, Issue 1, Page 61-69, Publication Year 2009	This study investigates the tolerance of mosquito larvae to several insecticides, having been exposed previously to sub-lethal concentrations of glyphosate. The glyphosate tested substance is Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. The direct glyphosate effects on mosquitos conferring increased tolerance to insecticides were assessed only at cellular and molecular level that cannot be related to the risk assessment.
2073	Ecotoxicology (incl. pollen/nectar residue)	Rochfort et al.	2009	NMR-based metabolomics using earthworms as potential indicators for soil health	METABOLOMICS, (MAR 2009) Vol. 5, No. 1, pp. 95-107	This study presents findings regarding metabolics and therefore only based on cellular and molecular level that cannot be related to the risk assessment. In addition, the tested material comes from different sites in Australia and therefore not dealing with EU / Japan representative uses / conditions (e.g. field locations, soil properties, etc.). Furthermore, the test item was Roundup formulation, probably containing the surfactant POEA (or any similar),

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						which is not permitted in formulated herbicidal products in the EU / Japan, and the observations are caused by mixture of compounds / potentially causal factors and thus not attributable to only glyphosate.
1054	Ecotoxicology (incl. pollen/nectar residue)	Saradhamani et al.	2009	Efficacy of herbicide Glyphosate on oxygen consumption of a fresh water fish , Catla catla	Indian Journal of Environment and Ecoplanning (2009), 16(1), 239-243	In this study, assessing the effects of glyphosate exposure on the rate of fish oxygen consumption after 96 hours, the test design and system are not relevant for the EU / Japan regulatory purposes. In addition, the test item was not identified as it was just indicated that it is glyphosate without further content/purity/source indication (it could be a formulation not relevant to the EU / Japan glyphosate renewal). Furthermore, the study seems to be not reliable at all, as shows several inconsistencies in the reported results' table (percent change in the rate of oxygen consumption at 72 h, significant difference detected for the 0.35 ppm concentration at 72 h, etc.) and text. The statistical analysis was not described and it is not possible to determine if it has been conducted or not.
1620	Ecotoxicology (incl. pollen/nectar residue)	Solomon et al.	2009	Human health and environmental risks from the use of glyphosate formulations to control the production of coca in Colombia: overview and conclusions.	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 914-20. Ref: 50	This is a scientific review article where no new data, just secondary information, is provided that can be used for risk assessment. In addition, most of the effects reported in this review were caused by mixture of compounds / potentially causal factors and thus not attributable to glyphosate itself.
397	Ecotoxicology (incl. pollen/nectar residue)	Soso et al.	2007	Chronic exposure to sub-lethal concentration of a glyphosate -based herbicide alters hormone profiles and affects reproduction of female Jundia (Rhamdia quelen).	Environmental Toxicology and Pharmacology, (MAY 2007) Vol. 23, No. 3, pp. 308-313	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in earthen ponds under open-air conditions in Brazil). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
3023	Ecotoxicology (incl. pollen/nectar residue)	Sparling et al.	2006	Toxicity of glyphosate as Glypro and LI700 to red-eared slider (trachemys scripta elegans) embryos and early hatchlings.	Environmental toxicology and chemistry, (2006 Oct) Vol. 25, No. 10, pp. 2768-74	This study presents observations caused by mixture of compounds (the glyphosate formaltion Glypro and a 3% solution of the surfactant LI700) and thus not attributable to only glyphosate.
1642	Ecotoxicology (incl.	Stachowski-	2008	Impact of Roundup on the marine	Aquatic toxicology (Amsterdam,	This publication deals with a Roundup formulation,

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
	pollen/nectar residue)	Haberkorn et al.		microbial community , as shown by an in situ microcosm experiment.	Netherlands), (2008 Sep 29) Vol. 89, No. 4, pp. 232-41	containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan.
2914	Ecotoxicology (incl. pollen/nectar residue)	Thompson et al.	2005	The impact of insecticides and herbicides on the biodiversity and productivity of aquatic communities.	Ecological applications : a publication of the Ecological Society of America (2006) , Vol. 16, No. 5, pp. 2022-2027	This publication deals with a Roundup formulation, containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the study design and test system is not fully relevant for regulatory purposes (All tested organisms included in these aquatic mesocosms were brought to the laboratory from natural unidentified sources and distributed into the different aquaria). Year of publication is 2005.
347	Ecotoxicology (incl. pollen/nectar residue)	Tierney et al.	2006	Changes in juvenile coho salmon electro-olfactogram during and after short-term exposure to current-use pesticides.	Environmental toxicology and chemistry, (2006 Oct) Vol. 25, No. 10, pp. 2809-17	In this literature article the effect of glyphosate and other pesticides on the olfaction of juvenile coho-salmons is examined. The assessed study endpoint is not regarded relevant for the EU / Japanese risk assessment.
2423	Ecotoxicology (incl. pollen/nectar residue)	Tierney et al.	2007	Relating olfactory neurotoxicity to altered olfactory-mediated behaviors in rainbow trout exposed to three currently-used pesticides.	Aquatic toxicology (Amsterdam, Netherlands), (2007 Feb 15) Vol. 81, No. 1, pp. 55-64	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the study design and test system (focused on olfactory-mediated behavioral effects) are not relevant for regulatory purposes.
1754	Ecotoxicology (incl. pollen/nectar residue)	Tsui et al.	2006	Influence of glyphosate and its formulation (Roundup super([registered])) on the toxicity and bioavailability of metals to Ceriodaphnia dubia	Environmental Pollution. Vol. 140, no. 2, pp. 59-68. Mar. 2006	In this study, the observations related with glyphosate (IPA salt) were caused by mixture of compounds (metal acute toxicity and accumulation on aquatic invertebrates when previously treated with glyphosate) and thus not attributable to glyphosate itself (e.g. mixture toxicity). The 48-h LC50 was calculated however for Roundup® and therefore dealing with a formulation containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the

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						AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
1095	Ecotoxicology (incl. pollen/nectar residue)	Watson et al.	2008	Environmental influences on Acinetobacter sp. strain BD413 transformation in soil	Biology and fertility of soils (2008) , Vol. 45, No. 1, pp. 83-92	In this literature article the effects of Roundup Ready Renew on Acinetobacter sp. strain BD413 transformation in soil were assessed. As the findings are only based on molecular level they cannot be related to the risk assessment.
979	Ecotoxicology (incl. pollen/nectar residue)	Weaver et al.	2007	Effects of glyphosate on soil microbial communities and its mineralization in a Mississippi soil .	Pest management science, (2007 Apr) Vol. 63, No. 4, pp. 388-93	This study consists of two different tests, one field study in USA not dealing with EU / Japan representative uses/conditions (e.g. field locations, soil properties, non-EU monitoring etc.) and one laboratory study with a study design and system that are not relevant for regulatory purposes. Only C-related (and not N-related) mineralization was measured, which is no longer relevant for the risk assessment.
447	Ecotoxicology (incl. pollen/nectar residue)	Whiteside et al.	2008	Comparison of a score-based approach with risk-based ranking of in-use agricultural pesticides in Canada to aquatic receptors.	Integr. Environ. Assess. Manage., Vol. 4, Issue 2, Page 215-236, Publication Year 2008	This article, presenting a new risk-based approach for ranking pesticides and their potential risk to aquatic life, only contains secondary ecotoxicological information from several sources: The Pesticide Manual of the British Crop Protection Council, USEPA pesticide registration data, the French AGRITOX, European Commission pesticide review reports, and the USEPA ECOTOX database. It does not present any new toxicity data. In addition, this publication deals with general pesticide exposures (not glyphosate specific).
2020	Ecotoxicology (incl. pollen/nectar residue)	Zabaloy et al.	2008	Microbial respiration in soils of the Argentine pampas after metsulfuron methyl, 2,4-D, and glyphosate treatments.	Communications in soil science and plant analysis (2008) , Vol. 39, No. 3-4, pp. 370-385	This publication does not deal with EU / Japan representative uses / conditions (e.g. Argentinian field locations with specific soil properties, etc.). In addition, the study focuses on the effects on microbial respiration (CO2 release) and this is not a data requirement according to EU Regulation 283/2013 anymore. Furthermore, the test item was not fully identified and the test soil had a previous history of pesticide applications that could have altered the diversity and levels of the microbial community.
179	Ecotoxicology (incl. pollen/nectar residue)	Zabaloy et al.	2008	An integrated approach to evaluate the impacts of the herbicides glyphosate, 2,4-D and metsulfuron-methyl on soil	Applied soil ecology (2008) , Vol. 40, No. 1, pp. 1-12	This publication is not considered relevant as the used test soils have a reported history of herbicide application. In addition, they originate from

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				microbial communities in the Pampas region, Argentina		agricultural fields of the Pampas region (Argentina) and might therefore not be regarded representative for the EU/Japan.
839	Ecotoxicology (incl. pollen/nectar residue)	Zahra et al.	2006	Effect of glyphosate on various blood parameters of fresh water fishes , Heteropneustes fossilis.	Flora and Fauna (Jhansi) (2006) , Vol. 12, No. 1, pp. 100-104	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. In addition, no analytical verification of the test item concentrations in the tested tap water was conducted and the origin/source of the tested fishes is not clear either.
2930	Ecotoxicology (incl. pollen/nectar residue)	Zhidenko et al.	2007	The influence of roundup on the dynamics of histological changes in organs of carps.	Hydrobiological Journal, (2007) Vol. 43, No. 2, pp. 93-99	This publication does provide histological changes after exposure to a Roundup formulation at 0.004 mg/L; no numerical/graphical results are provided. The description of the study design is very limited, the test conditions are poorly described and the effects cannot be related to the risk assessment. Therefore this study is not regarded relevant.
746	Ecotoxicology (incl. pollen/nectar residue)	Zhydenko	2008	Dynamics of the juvenile carps hematological parameters under the impact of herbicides.	Hydrobiological Journal, (2008) Vol. 44, No. 5, pp. 73-80	This publication is dealing with a "Roundup" formulation (no indication of which one) probably containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the findings are all based on cellular and molecular level (changes of the hematological parameters) that cannot be related to the risk assessment.
1092	Ecotoxicology (incl. pollen/nectar residue)/ Efate	Tsui et al.	2008	Environmental fate and non-target impact of glyphosate -based herbicide (Roundup) in a subtropical wetland.	Chemosphere, (2008 Mar) Vol. 71, No. 3, pp. 439-46. Electronic Publication Date: 26 Dec 2007	The Roundup formulation used in the study contains POEA surfactant which is not permitted in formulated herbicidal products in the EU / Japan. The ecotoxicologically relevant findings of this field study (in situ bioassay of fish in a freshwater & estuarine pond) cannot clearly be related to the application of the Roundup formulation as a very open test design was chosen and test species might be exposed to multiple chemicals/stressors. Environmental fate in a subtropical wetland can for various reasons not readily transferred to agricultural conditions considered relevant.

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2830	E-fate	Adams et al.	2007	The Absence of Glyphosate Residues in Wet Soil and the Adjacent Watercourse after a Forestry Application in New Brunswick.	Northern journal of applied forestry (2007) , Vol. 24, No. 3, pp. 230-232	Study design is not relevant for the European regulatory purposes and no relevant endpoint was determined. Glyphosate product was applied at a field site in Canada and a water stream and water saturated soil was analysed.
807	E-fate	Adil et al.	2009	Effect of agricultural chemicals on aquatic ecosystem in Guyana	Global Journal of Environmental Research, (2009) Vol. 3, No. 1, pp. 22-25. CODEN: GJERAW.	Publication is reporting on water monitoring under Non-EU conditions which are not relevant for the enviromental risk assessments. Detected residues in algae are considered to be not relevant for the dietary risk assessment as it is neither clear these algal speciel are suitable for human consuption or ever harvested for human consumption, also residues cannot be attributed to a GAP relevant for EU and might be caused by misuse or accidental spillage uncleare exposure.
743	E-fate	Alexa et al.	2009	Dynamic of glyphosate mineralization in different soil types.	Romanian Agricultural Research (2009) , No. 26, pp. 57-60	Study design not relevant for the European regulatory purposes. Different soils from Romania were incubated with glyphosate for 40 days. Only the evolved CO2 was measured. No endpoints can be derived.
2219	E-fate	Barrett et al.	2007	Phosphate and glyphosate mobility in soil columns amended with roundup	Soil science (2007) , Vol. 172, No. 1, pp. 17-26	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. It was investigated whether moderately low glyphosate application rates could mobilize significant PO43- in coarse-textured soils. No endpoints for risk assessment are generated.
2641	E-fate	Bazot et al.	2008	Simultaneous mineralization of glyphosate and diuron by a consortium of three bacteria as free-and/or immobilized-cells formulations.	Applied microbiology and biotechnology, (2008 Jan) Vol. 77, No. 6, pp. 1351-8	Study design is not relevant for the European regulatory purposes. Three isolated bacteria strains were assessed to study the simulaneous mineralisation of glyphosate and diuron.
703	E-fate	Bhaskara et al.	2006	Direct sensitive spectrophotometric determination of glyphosate by using ninhydrin as a chromogenic reagent in formulations and environmental water samples.	Helvetica Chimica Acta (2006) , Vol. 89, No. 11, pp. 2686-2693	Publication dealing with analytical methods / development. Method validation was performed with field water sampled from irrigated land in India.
2189	E-fate	Carpenter et al.	2008	Pesticide Occurrence and Distribution in the Lower Clackamas River Basin, Oregon, 2000-2005	Scientific Investigations Report. U.S. Geological Survey. no. 2008-5027, 99 pp. 2008	Publication not dealing with EU representative uses / conditions (non-EU monitoring).
2230	E-fate	Chen et al.	2007	Photodegradation of glyphosate in the ferrioxalate system.	Journal of hazardous materials, (2007 Sep 05) Vol. 148, No. 1-2, pp. 360-5	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. Wavelength of the used lamp

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						was > 365 nm and the focus of the article was the photodegradation in a ferrioxalate system.
3145	E-fate	Choquette et al.	2009	Water Quality and Evaluation of Pesticides in Lakes in the Ridge Citrus Region of Central Florida	Scientific Investigations Report. U.S. Geological Survey. no. 2008-5178, 55 pp. 2009	Publication not dealing with Japan/EU representative uses / conditions (non-EU monitoring).
2216	E-fate	Comoretto et al.	2007	Pesticides in the Rhone river delta (France): Basic data for a field-based exposure assessment .	Science of the Total Environment, (JUL 15 2007) Vol. 380, No. 1-3, Sp. Iss. SI, pp. 124-132	Publication where glyphosate or a relevant metabolite were not the focus of the publication.
126	E-fate	Da et al.	2007	Adsorption of glyphosate on clays and soils from Parana state: Effect of pH and phosphate competitive adsorption of phosphate .	Brazilian Archives of Biology and Technology, (MAY 2007) Vol. 50, No. 3, pp. 385-394	No endpoints for risk assessment are generated. Only amout of glyphosate adsorbed reported, no Koc/Kfoc.
2667	E-fate	Damonte et al.	2007	Some aspects of the glyphosate adsorption on montmorillonite and its calcined form. Clay and Health - clays in pharmacy, cosmetics, pelotherapy, and environment protection .	Applied Clay Science (2007) , Vol. 36, No. 1/3, pp. 86-94	Study design is not relevant for the European regulatory purposes. Adsorption to specific mineral, no relevant endpoints were determined.
776	E-fate	De et al.	2006	Effect in glyphosate adsorption on clays and soils heated and characterization by FT-IR spectroscopy.	Geoderma, (DEC 15 2006) Vol. 136, No. 3-4, pp. 738-750	Study design not relevant for the European regulatory purposes. Adsorption of glyphosate was tested on clay minerals and soil. The effect of heating on the clay and soils was investigated. The glyphosate concentration in the supernatant was not determined. No endpoints can be derived.
994	E-fate	Djonova et al.	2008	Effects of mechanical and chemical combating Sorghum halepensis (L.) Pers on soil microflora.	Journal of Balkan Ecology (2008) , Vol. 11, No. 4, pp. 383-390	Findings not related to environmental fate. The effect of glyphosate on the microbial polulation was investigated.
614	E-fate	Doublet et al.	2009	Delayed degradation in soil of foliar herbicides glyphosate and sulcotrione previously absorbed by plants : consequences on herbicide fate and risk assessment .	Chemosphere, (2009 Oct) Vol. 77, No. 4, pp. 582-9	Study design not relevant for the European regulatory purposes. Glyphosate was sprayed on leavea of oilseed rape and maize plants instead of bare soil.
2459	E-fate	Ersilia et al.	2008	Researches regarding the microorganisms influence on glyphosate biodegradation	Journal of Agroalimentary Processes and Technologies (2008), 14(2), 498-502	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. No endpoints for risk assessment are generated. The effect of glyphosate on the soil microbial biomass was investigated.
2899	E-fate	Eser et al.	2007	The effects of glyphosate isopropylamine and trifluralin on the carbon mineralization of olive tree soils . Original Title: Zeytin Topraklarinin Karbon	Turkish Journal of Agriculture and Forestry, (2007) Vol. 31, No. 5, pp. 297-302	Study design and test system that are not relevant for the European regulatory purposes and publications dealing with a Roundup formulation and thus not relevant to the EU glyphosate renewal.

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				Mineralizasyonuna Glyphosate Isopropylamine ve Trifluralin and apos;in Etkileri.		
478	E-fate	Ghanem et al.	2007	Concentrations and specific loads of glyphosate , diuron, atrazine, nonylphenol and metabolites thereof in French urban sewage sludge.	Chemosphere,（2007 Nov）Vol. 69, No. 9, pp. 1368-73	Test system not relevant for the European regulatory purposes. The concentration of glyphosate in sewage sludge was determined.
1235	E-fate	Ghanem et al.	2006	Fate of herbicides and nonylphenol in soil - plant - water systems amended with contaminated sewage sludge	Environmental Chemistry Letters. Vol. 4, no. 2, pp. 63-67. Jun 2006	Study design not relevant for the European regulatory purposes. A mixture of compounds was studied.
2675	E-fate	Gimsing et al.	2007	Sorption of glyphosate and phosphate by variable-charge tropical soils from Tanzania.	Geoderma,（FEB 15 2007）Vol. 138, No. 1-2, pp. 127-132	Study design that is not relevant for the European regulatory purposes and Publication generating endpoints that are not relatable to the EU level risk assessment. Competitive sorption of glyphosate and phosphate was investigated.
1655	E-fate	Gomez et al.	2009	Impact of glyphosate application on microbial biomass and metabolic activity in a Vertic Argiudoll from Argentina.	European Journal of Soil Biology,（MAR-APR 2009）Vol. 45, No. 2, pp. 163-167	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. No endpoints for risk assessment are generated. The effect of glyphosate on the soil microbial biomass was investigated.
2362	E-fate	Goudarzi et al.	2009	QSPR Modeling of Soil Sorption Coefficients（KOC）of Pesticides Using SPA-ANN and SPA-MLR.	J. Agric. Food Chem., Vol. 57, Issue 15, Page 7153-7158, Publication Year 2009	Publication where glyphosate was not the focus of the publication. A QSAR model was developed, glyphosate was among the 124 substances used as input data.
787	E-fate	Hu et al.	2009	Effect of Glyphosate on Soil Enzyme	Journal of Agro-Environment Science [J. Agro-Environ. Sci.]. Vol. 28, no. 4, pp. 680-685. 20 Apr 2009	The article is in Chinese.
2213	E-fate	Hushon	2006	Pesticides in Southwest Florida waterways - A report card.	Florida Scientist,（2006）Vol. 69, No. Suppl. 2, pp. 100-116	Publications not dealing with EU representative uses / conditions (non-EU monitoring).
1276	E-fate	Jankowska et al.	2008	Fluctuations in counts of some microorganisms in lake water caused by the herbicide ROUNDUP 360 SL.	Polish Journal of Natural Sciences（2008）, Vol. 23, No. 1, pp. 121-133	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. The effect of glyphosate concentration on the counts of bacteria in lake water was investigated. No endpoints for risk assessment are generated.
2036	E-fate	Klier et al.	2008	Modelling the Environmental Fate of the Herbicide Glyphosate in Soil Lysimeters	Water, air and soil pollution. Focus（2008）, Vol. 8, No. 2, pp. 187-207	Not relevant, as the focus is on development of a model and transgenic soybeans play a major role. The TSCF was only calculated by a model and no results is given. Additonally, glyphosate was applied to plants by foliar application (not to bare soil).

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3089	E-fate	Kolpin et al.	2006	Urban contributions of glyphosate and its degradate AMPA to streams in the United States.	Science of the Total Environment (2006) , Vol. 354, No. 2/3, pp. 191-197	Publication not dealing with Japan/European conditions (field location in the United States).
1493	E-fate	Laitinen et al.	2007	Glyphosate translocation from plants to soil - does this constitute a significant proportion of residues in soil	Plant and soil (2007) , pp. 51-60	Study design not relevant for the European regulatory purposes. Translocation of glyphosate (N-(phosphonomethyl)glycine) to plant roots and its impact on detected herbicide residues in sandy loam soil were studied in a glasshouse pot experiment in Finland. Glyphosate was sprayed on leaves of Quinoa plants.
1236	E-fate	Laitinen et al.	2006	Fate of the herbicides glyphosate, glufosinate-ammonium, phenmedipham, ethofumesate and metamitron in two Finnish arable soils.	Pest Manage. Sci., Vol. 62, Issue 6, Page 473-491, Publication Year 2006	Study design not relevant for the European regulatory purposes. Glyphosate (Roundup ready) was sprayed on glyphosate resistant sugar beet instead of bare soil.
2652	E-fate	Magga et al.	2008	Soil column experiments used as a means to assess transport , sorption , and biodegradation of pesticides in groundwater .	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2008 Nov) Vol. 43, No. 8, pp. 732-41	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. Column leaching was performed with artifical groundwater (not artificial rainwater) and over a period of 6.5 months glyphosate was continuously applied to the column.
712	E-fate	Newton et al.	2008	Dissipation of four forest-use herbicides at high latitudes.	Environmental science and pollution research international, (2008 Oct) Vol. 15, No. 7, pp. 573-83	Publications not dealing with Japan/EU representative uses / conditions (e.g. field location) . Dissipation of glyphosate was investigated in forests of Alaska.
1623	E-fate	Ockerman	2008	Hydrologic Conditions and Quality of Rainfall and Storm Runoff for Two Agricultural Areas of the Oso Creek Watershed, Nueces County, Texas, 2005-07	Scientific Investigations Report. U.S. Geological Survey. no. 2008-5103, 67 pp. 2008	Publication not dealing with Japan/EU representative conditions (i.e. monitoring location). The purpose of this report was to characterize hydrologic conditions and the water quality of rainfall and storm runoff for two primarily agricultural subwatersheds in the Oso Creek watershed in Nueces County (Texas, U.S.).
1917	E-fate	Peruzzo et al.	2008	Levels of glyphosate in surface waters , sediments and soils associated with direct sowing soybean cultivation in north pampasic region of Argentina.	Environmental pollution (Barking, Essex : 1987), (2008 Nov) Vol. 156, No. 1, pp. 61-6	Publication not dealing with Japan/EU conditions (field location in Argentina and a transgenic soybean cultivation area).
1451	E-fate	Pessagno et al.	2008	Glyphosate behavior at soil and mineral-water interfaces.	Environmental pollution (Barking, Essex : 1987), (2008 May) Vol. 153, No. 1, pp. 53-9	Study design not relevant for the European regulatory purposes. Adsorption was tested in solutions with adjusted pH. Isotherms were established according to Langmuir. One soil was previously treated with H2O2 to reduce organic matter content.

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1476	E-fate	Rampoldi et al.	2008	Glyphosate mineralization : effect of temperature and soybean and corn crop residues .	Chilean Journal of Agricultural Research (2008) , Vol. 68, No. 1, pp. 13-20	Study design not relevant for the European regulatory purposes. The kinetics of mineralization of glyphosate in stubbles of soybean and corn were investigated. No endpoints for risk assessment are generated.
610	E-fate	Sailaja et al.	2006	Degradation of glyphosate in soil and its effect on fungal population .	Journal of environmental science and engineering, (2006 Jul) Vol. 48, No. 3, pp. 189-90	Study design not relevant for the European regulatory purposes. Glyphosate (Glycel, 41% pure) was sprayed on the foliage of weeds instead of bare soil.
261	E-fate	Sandall et al.	2009	Avoiding Glyphosate and Atrazine Runoff and Groundwater Contamination	Crop watch (2009) , No. 18 Source Note: 2009 June 26, no. 18	Opinion article that provides no new data that can be used for risk assessment. Guidance for farmers on how to avoid runoff of glyphosate and atrazine.
284	E-fate	Santos et al.	2009	Biodegradation of glyphosate in rhizospheric soil cultivated with Glycine max, Canavalia ensiformis and Stizolobium aterrimum.	Planta Daninha (2009) , Vol. 27, No. 4, pp. 781-787	Study design not relevant for the European regulatory purposes. Untreated and previously cultivated Brazilian soil (Red-Yellow Argisol) was incubated with glyphosate for 32 days. Only the evolved CO2 was measured. No endpoints for risk assessment are generated.
479	E-fate	Scribner et al.	2007	Concentrations of Glyphosate, Its Degradation Product, Aminomethylphosphonic Acid, and Glufosinate in Ground-and Surface-Water, Rainfall, and Soil Samples Collected in the United States, 2001-06	Scientific Investigations Report. U.S. Geological Survey. no. 2007-5122, 112 pp. 2007. URL (Document):	Publication not dealing with Japan/EU representative conditions (i.e. monitoring location). The concentration of glyphosate and AMPA was determined in soil, rainfall, ground- and surface water samples collected in the U.S..
2672	E-fate	Shushkova et al.	2009	Sorption and microbial degradation of glyphosate in soil suspensions	Applied biochemistry and microbiology (2009) , pp. 599-603	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. The adsorption of glyphosate was studied after application of a product (Ground Bio) containing the active agent is glyphosate isopropylamine salt. No endpoints for risk assessment are generated.
1488	E-fate	Starrett et al.	2008	Glyphosate runoff when applied to zoysiagrass under golf course fairway conditions	ACS Symposium Series, (2008) Vol. 997, No. Fate of Nutrients and Pesticides in the Urban Environment, pp. 237-253, 1 plate	Publication not dealing with Japan/EU representative conditions (i.e. non-EU field location). Publication dealing with a Roundup formulation that is not representative for AIR5. The objectives of the study were: (1) to measure glyphosate runoff from zoysiagrass fairways on a golf course in Kansas (U.S.) following the application of Roundup herbicide, (2) to determine glyphosate runoff concentrations and their resulting effect on the environment, and (3) to provide up-to-date data

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						of research findings on pesticide transport when applied to turfgrass.
2691	E-fate	Stenrod et al.	2006	Spatial variability of glyphosate mineralization and soil microbial characteristics in two Norwegian sandy loam soils as affected by surface topographical features	Soil biology and biochemistry (2006) , Vol. 38, No. 5, pp. 962-971	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. The effect of glyphosate concentration on soil physical and microbial properties was investigated. Furthermore, the mineralization rate of glyphosate was determined in different activity samples. No endpoints for risk assessment are generated.
121	E-fate	Wang et al.	2009	Adsorption Kinetics of Glyphosate and Copper(II) Alone and Together on Two Types of Soils	Soil Science Society of America journal (2009) , pp. 1995-2001	No endpoints for risk assessment are generated. Adsorption kinetics were investigated in a flow method (column) experiment, but no adsorption coefficient determined.
568	E-fate	Wang et al.	2006	Cosorption of zinc and glyphosate on two soils with different characteristics.	Journal of Hazardous Materials, (SEP 1 2006) Vol. 137, No. 1, pp. 76-82	Study design not relevant for the European regulatory purposes. Adsorption isotherms were determined for glyphosate in absence and presence of Zn. NaNO3 was used as test solution instead of CaCl2. Isotherms are shown graphically but no linear equations are presented. No endpoints can be derived from the study.
1021	E-fate	Warnemuende et al.	2007	Effects of tilling no-till soil on losses of atrazine and glyphosate to runoff water under variable intensity simulated rainfall	Soil and tillage research (2007) , Vol. 95, No. 1-2, pp. 19-26	Publication not dealing with Japan/EU representative conditions (i.e. field location). The runoff of glyphosate and atrazine was tested on field plots in the U.S..
1899	E-fate	Xu et al.	2009	Land use and riparian effects on prairie wetland sediment properties and herbicide sorption coefficients.	Journal of environmental quality, (2009 Jul-Aug) Vol. 38, No. 4, pp. 1757-65	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. Adsorption study performed with sediment of a wetland. Only mean values (5 sampling points and four cores per point) were reported.
641	E-fate	Yoshioka et al.	2006	Determination of Glyphosate and Its Major Metabolite Aminomethylphosphonic Acid in River Water and Tap Water by High-Performance Liquid Chromatography with Postcolumn Derivatization Method	Bunseki Kagaku [Bunseki Kaguku]. Vol. 55, no. 3, pp. 177-184. 2006. ISSN: 0525-1931	The article is about the development of analytical method to analyze Glyphosate and AMPA in river water and tap water which is considered not relevant for the submission in Japan.
1781	E-fate	Zablotowicz et al.	2006	Influence of watershed system management on herbicide concentrations in Mississippi Delta oxbow lakes.	The Science of the total environment, (2006 Nov 1) Vol. 370, No. 2-3, pp. 552-60. Electronic Publication: 2006-09-	Publication where glyphosate or a relevant metabolite were not the focus of the publication. Glyphosate was not among the active substances measured in the article.

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
					26	
1477	E-fate	Zhao et al.	2009	Glyphosate mobility in soils by phosphate application: Laboratory column experiments.	Geoderma, (MAR 15 2009) Vol. 149, No. 3-4, pp. 290-297	Study design not relevant for the European regulatory purposes. Adsorption and column experiments were performed with glyphosate. For the adsorption experiments the soil pH twas adjusted to pH 3–9. The flow direction of the column experiment was from bottom to top. According to the OECD 312 guideline, artificial rain should be applied to the soil columns and the leachate collected. No endpoints were determined in the study.
220	Efficacy	Ransom	2009	Applying Glyphosate Pre-Harvest in Small-Grains	Crop and pest report (2009) , Number 12, pp. 7-8 Source Note: 2009 July 29, issue 12	The article is an application recommendation/suggestion from the North Dakota State University (NDSU) to the farmers. The glyphosate-note is just a small part of it.
37	Efficacy	Service	2007	A growing threat down on the farm.	Science, (25 May 2007) Vol. 316, No. 5828, pp. 1114-1117.	The articles provides an overview about the history and market importance of glyphosate, brief description of a mode of action, first resistance cases, advantages of no-till agriculture, possible replacements/supplements for glyphosate resistant crops.
1209	Human safety (metabolism/toxicology)	Acquavella et al.	2006	Exposure misclassification in studies of agricultural pesticides: Insights from biomonitoring	Epidemiology (Jan 2006) Vol. 17, No. 1, pp. 69-74	A algorithm proposed by Dosemeci and colleagues to estimate lifetime average exposure intensity from questionnaire information. The algorithm was evaluated to measure urinary pesticide concentrations for farmers who applied glyphosate. Statistical analyses included nonparametric correlations, assessment of categorical agreement, and categorical evaluation of exposure distributions.
1698	Human safety (metabolism/toxicology)	Amer et al.	2006	In vitro and in vivo evaluation of the genotoxicity of the herbicide glyphosate in mice .	Bulletin of the National Research Centre (Cairo), (2006) Vol. 31, No. 5, pp. 427-446	Information on concentrations is questionable for in vitro part, as M glyphosate/mL medium is no scientific unit for a concentration. It should be noted, that an ip. injection is not a relevant route of administration and thus considered not relevant to human risk assessment.
2086	Human safety (metabolism/toxicology)	Anadon et al.	2008	Neurotoxicological effects of the herbicide glyphosate	Toxicology Letters [Toxicol. Lett.]. Vol. 180, S164 p. 5 Oct 2008	No full text available (congress abstract only)
1147	Human safety (metabolism/toxicology)	Andre et al.	2007	Evaluation of bulky DNA adduct levels after pesticide use: comparison between	Toxicol. Environ. Chem., Vol. 89, Issue 1, Page 125-139,	Groups of farmers were classified according to the main pesticide sprayed (triazoles or chlorothalonil

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
				open-field farmers and fruit growers.	Publication Year 2007	for open-field farmers n=19; captan for fruit growers n=29). Two blood samples were collected on consecutive days for each farmer, and white blood cell bulky DNA adduct levels were evaluated by 32P-postlabelling method. Glyphosate was only detected in 1/29 farmers. No association between glyphosate exposure and bulky adducts was observed. Farmers were exposed to pesticide mixtures, no further information on exposure and the exposed subtances (batch, manufacturer, analytics, adjuvants) were given.
873	Human safety (metabolism/toxicology)	Astiz et al.	2009	Effect of pesticides on cell survival in liver and brain rat tissues.	Ecotoxicology and environmental safety, (2009 Oct) Vol. 72, No. 7, pp. 2025-32	Non-relevant route of exposure (i.p. injections)
206	Human safety (metabolism/toxicology)	Astiz et al.	2009	Antioxidant defense system in rats simultaneously intoxicated with agrochemicals.	Environmental Toxicology and Pharmacology, (NOV 2009) Vol. 28, No. 3, pp. 465-473	Non-relevant route of exposure (i.p. injections)
1469	Human safety (metabolism/toxicology)	Baucom et al.	2008	Glyphosate induces transient male sterility in Ipomoea purpurea	Botany (2008) , Volume 86, Number 6, pp. 587-594, Electronic ISSN: 1916-2804 Source Note: 2008 June, v. 86, no. 6	The article relates to reproduction and fertility in male Ipomoea purpurea (flower - morning-glory). The test item was not identified in the M&M section (although it seems that they used a Roundup formulation probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan). In addition, the study design and test system are not really relevant for the European regulatory purposes (flowering is not a parameter to be used in the RA). Furthermore, an important part of the test was conducted under US field conditions and therefore, not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).
2987	Human safety (metabolism/toxicology)	Benachour et al.	2007	Time-and dose-dependent effects of roundup on human embryonic and placental cells.	Archives of environmental contamination and toxicology, (2007 Jul) Vol. 53, No. 1, pp. 126-33	Excessive doses exceed typical in vitro limit doses. In vitro test system is inappropriate for formulations containing surfactants.
1463	Human safety (metabolism/toxicology)	Benachour et al.	2009	Glyphosate formulations induce apoptosis and necrosis in human umbilical, embryonic , and placental cells.	Chemical research in toxicology, (2009 Jan) Vol. 22, No. 1, pp. 97-105	Excessive doses exceed typical in vitro limit doses. In vitro test system is inappropriate with surfactants
2890	Human safety	Caglar et al.	2008	The effect of sub-acute and sub-chronic	Environmental Toxicology and	The aim of the study was biochemical and

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
	(metabolism/toxicology)			exposure of rats to the glyphosate -based herbicide Roundup.	Pharmacology, (JAN 2008) Vol. 25, No. 1, pp. 57-62	histopathological examination of the toxic effects of glyphosate-based herbicide Roundup in rat liver, However the tested Roundup contains POEA which is no longer in the composition of the representative formulation.
2515	Human safety (metabolism/toxicology)	Cericato et al.	2009	Responsiveness of the interrenal tissue of Jundia (Rhamdia quelen) to an in vivo ACTH test following acute exposure to sublethal concentrations of agrochemicals	Comparative Biochemistry and Physiology, Part C: Toxicology and Pharmacology (2009), 149C(3), 363-367	Jundiá (Rhamdia quelen) [catfish]; not relevant species.
1411	Human safety (metabolism/toxicology)	Climent et al.	2008	Glyphosate Poisoning	Clinical Toxicology [Clin. Toxicol.]. Vol. 46, no. 5, p. 419. Jun 2008	The publication is reporting effects after a 39-year-old male patient who consumed intentionally more than 200 ml of glyphosate. This is not relevant for glyphosate dossier and risk assessment.
2294	Human safety (metabolism/toxicology)	Dallegrave et al.	2007	Pre-and postnatal toxicity of the commercial glyphosate formulation in Wistar rats .	Archives of toxicology, (2007 Sep) Vol. 81, No. 9, pp. 665-73	Non-relevant formulation tested
2159	Human safety (metabolism/toxicology)	El-Shenawy	2009	Oxidative stress responses of rats exposed to Roundup and its active ingredient glyphosate .	Environmental Toxicology and Pharmacology, (NOV 2009) Vol. 28, No. 3, pp. 379-385	The publication is reporting information on oxidative stress responses to rats exposed to Roundup and its active ingredient glyphosate; however using intraperitoneal route of exposure which is not relevant for risk assessment.
2207	Human safety (metabolism/toxicology)	Fisher et al.	2008	Pesticide-associated pemphigus vulgaris.	Cutis, (2008 Jul) Vol. 82, No. 1, pp. 51-4	Case report 40 year old men with pemphigus vulgaris, developed within days of a one-time heavy exposure to fumes of burning glyphosate. No definded information on exposure and the exposed subtance (batch, manufacturer, analytics, adjuvants) were given.
1592	Human safety (metabolism/toxicology)	Gardner et al.	2008	Herbicides, glyphosate resistance and acute mammalian toxicity : simulating an environmental effect of glyphosate -resistant weeds in the USA.	Pest management science, (2008 Apr) Vol. 64, No. 4, pp. 470-8	Usage field-level data to assess glyphosate-resistant (GR) technology with a mammalian toxicity environmental indicator. Use is made of Agricultural Resource Management Survey (ARMS) data collected by the United States Department of Agriculture (USDA) to calculate actual farm-level LD50 doses, and a treatment effect regression model is employed to test the hypotheses. The article is dealing wiht model prediction which is not a toxicological endpoint and then not relevant for risk assessment.
1388	Human safety (metabolism/toxicology)	Gasnier et al.	2009	Glyphosate -based herbicides are toxic and endocrine disruptors in human cell	Toxicology, (2009 Aug 21) Vol. 262, No. 3, pp. 184-91	Excessive doses exceed typical in vitro limit doses. In vitro test system is inappropriate with formulation

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
				lines.		containing surfactants.
1389	Human safety (metabolism/toxicology)	Gehin et al.	2006	Glyphosate -induced antioxidant imbalance in HaCaT: The protective effect of vitamins C and E.	Environmental Toxicology and Pharmacology, (JUL 2006) Vol. 22, No. 1, pp. 27-34	Roundup 3 plus®, induced significant changes in cellular antioxidant status as a glutathione depletion, enzymatic (catalase, glutathione-peroxidase and superoxide dismutase) disorders, and increased lipid peroxidation. Tested product contains 8% (m/m) polyoxyethylene amine (POEA), which is no longer in the composition of the representative formulation.
1103	Human safety (metabolism/toxicology)	Heras-Mendaza et al.	2008	Erythema multiforme-like eruption due to an irritant contact dermatitis from a glyphosate pesticide.	Contact dermatitis, (2008 Jul) Vol. 59, No. 1, pp. 54-6	Case report 37 year old female gardener noticed redness on her arms which became eczematous on day 2. At 5 day erythemato-purpuric plaques appeared on the skin of the upper extremities as well as target-like lesions on the abdomen, axillae and groin. After recovery, patch tests performed with the Spanish Standard series (True Test and Chemotechnique) and the Pesticide series (Martı ´ Tor , Barcelona, Spain) were negative. The observed irritant contact dermatitis (ICD) was developed by sweat or wet conditions. Additionally, she delayed rinsing off the herbicide. Tested product contains polyoxyethylene amine (POEA), which is no longer in the composition of the representative formulation.
2880	Human safety (metabolism/toxicology)	Lee et al.	2008	The early prognostic factors of glyphosate - surfactant intoxication.	The American journal of emergency medicine, (2008 Mar) Vol. 26, No. 3, pp. 275-81	Case study on intoxicated patients (58 patients (19 men and 39 women; age, 48.8 ± 15.8 years)) of Chang Gung Memorial Hospital, Taiwan from April 1996 to March 2003 and Taichung Veterans General Hospital, Taiwan from April 2000 to October 2003. No information on substance, administered dose and incidence of intoxication for the patients are given. The intake of the substance was only confirmed via physical examination and statements of patients/witnesses (no analytical analysis was performed).
1083	Human safety (metabolism/toxicology)	Lerda	2009	Endocrine disruptors (ED) and human exposure	Research and Reviews in BioSciences, (2009) Vol. 3, No. 2-3, pp. 106-111	In occupational exposure studies, the exposed and control individuals' blood, urine or sperm samples were used, mainly to determine the level of exposure.

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						No defined information on time and/or way of exposure and the exposed subtance (batch, manufacturer, analytics, adjuvants) were given. The levels of several pollutants were studied as well as other biochemical parameters related to exposure (gentox and mutagenesis, sperm quality, prostate, neurobehaviuor, cancer). The observed effect were not assignable to the reasoning chemical.
709	Human safety (metabolism/toxicology)	Levine et al.	2007	Disrupting mitochondrial function with surfactants inhibits MA-10 Leydig cell steroidogenesis	Cell Biology and Toxicology, (2007) Vol. 23, No. 6, pp. 385-400	The study results demonstrate how perturbation of the mitochondrial membrane by surfactants inhibits import, processing, and cholesterol transfer activity and underscore the importance of including sensitive assays that evaluate mitochondrial function when screening for potential effects on steroidogenesis with in vitro test systems. The roundup product tested contains 16.5% glyphosate-isopropylamine salt (which corresponds to approximately 12.2% glyphosate acid) and 6.1% MON 0818 (POEA). POEA is no longer in the composition of the representative formulation.
1338	Human safety (metabolism/toxicology)	Manas et al.	2009	Genotoxicity of glyphosate assessed by the comet assay and cytogenetic tests.	Environmental Toxicology and Pharmacology (2009) , Vol. 28, No. 1, pp. 37-41	This study applied 3 genotoxicity tests with obvious deviations to current guidelines. The i.p. route of exposure used for the micronucleus assay renders the study irrelevant for human exposure. In the in vitro assays most concentrations used were above 1 mM. Because it is physiologically not possible to attain such concentrations in standard regulatory in vivo testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in in vivo test systems, the results of the in vitro test are not considered relevant for human health risk assessment of glyphosate. Positive in vitro findings were only observed at concentrations above 1 mM.
2210	Human safety (metabolism/toxicology)	Mink et al.	2008	Pesticides and prostate cancer : A review of epidemiologic studies with specific agricultural exposure information.	European Journal of Cancer Prevention, (April 2008) Vol. 17, No. 2, pp. 97-110	Publication is a Secondary information (e.g. scientific or regulatory reviews) and as such not relevant for the risk assessments. Data of primary research atricles matching search terms of the Glyphosate search are evaluated elsewhere in the

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
						Literature review.
1158	Human safety (metabolism/toxicology)	Mladinic et al.	2009	Evaluation of genome damage and its relation to oxidative stress induced by glyphosate in human lymphocytes in vitro .	Environmental and molecular mutagenesis, (2009 Dec) Vol. 50, No. 9, pp. 800-7	This study is a non-GLP, non-guideline in vitro study although it meets generally accepted scientific principles. However, due to the occurrence of apoptosis, a clear conclusion on the relevance of the positive response cannot be reached.
246	Human safety (metabolism/toxicology)	Mladinic et al.	2008	Assessment of oxidative DNA damage by glyphosate applying hOGG1 modified comet and micronucleus assay	Toxicology Letters [Toxicol. Lett.]. Vol. 180, pp. S170-S171. 5 Oct 2008	Abtract only; data presented refer to Mladinic et al. 2009
600	Human safety (metabolism/toxicology)	Moura et al.	2009	Cytogenetic biomonitoring of Brazilian workers exposed to pesticides: Micronucleus analysis in buccal epithelial cells of soybean growers.	Mutat. Res., Genet. Toxicol. Environ. Mutagen., Vol. 675, Issue 1-2, Page 1-4, Publication Year 2009	MNT analysis of buccal epithelial cells of soybean growers. 29 Brazilian workers exposed to pesticides in soybean fields and in 37 non-exposed individuals. Participants were grouped according theit smoking and drinik habbits. No definded information on exposure and the exposed subtances were given.
2813	Human safety (metabolism/toxicology)	Naydenova et al.	2007	Synthesis, cytotoxicity and clastogenicity of novel alpha-aminophosphonic acids.	Amino acids, (2007 Nov) Vol. 33, No. 4, pp. 695-702	This study is a non-GLP, non-guideline conforming in vivo study. The cytotoxicity, clastogenic and antiproliferative effect of different substances are testes. No informations on test items (batch, expiration date, storage, manufacturer) are given. Characterization of newly synthetized derivates, where glyphosate was used as reference substance fot cytotoxicity.
1019	Human safety (metabolism/toxicology)	Oliveira et al.	2007	Effects of the herbicide Roundup on the epididymal region of drakes Anas platyrhynchos.	Reproductive toxicology (Elmsford, N.Y.), (2007 Feb) Vol. 23, No. 2, pp. 182-91	Study on male ducks (Anas platyrhynchos); non-relevant species for risk assessment.
1082	Human safety (metabolism/toxicology)	Orton et al.	2009	Endocrine Disrupting Effects of Herbicides and Pentachlorophenol: In Vitro and in Vivo Evidence.	Environ. Sci. Technol., Vol. 43, Issue 6, Page 2144-2150, Publication Year 2009	12 environmentally relevant pesticides (11 herbicides and pentachlorophenol (PCP)) were tested for their endocrine disrupting potential in two in vitro assays. Glyphosate was not tested in the study. Xenopus oocytes were used to measure effects on the ovulatory response and ovarian steroidogenesis.
1130	Human safety (metabolism/toxicology)	Paz-Y-Mino et al.	2007	Evaluation of DNA damage in an Ecuadorian population exposed to glyphosate .	Genetics and Molecular Biology, (2007) Vol. 30, No. 2, pp. 456-460	This publication is assessed to be not relevant for human health risk assessment in the EU, as the glyphosate formulation (Roundup Ultra) was applied at much higher dose rates (20x maximum application rate) than recommended for the

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
						intended uses in the EU. Potential confounding effects from excess toxicity are thus compromising the relevance of this publication, especially since they were not sufficiently accounted for by the authors. In addition, the herbicide was combined with the adjuvant "Cosmoflux 411F", which will not be used in the EU, and might influence the results and interpretations drawn from the Comet Assay.
1340	Human safety (metabolism/toxicology)	Poletta et al.	2009	Genotoxicity of the herbicide formulation Roundup (glyphosate) in broad-snouted caiman (Caiman latirostris) evidenced by the Comet assay and the Micronucleus test.	Mutation research, (2009 Jan 31) Vol. 672, No. 2, pp. 95-102	Comet assay and Micronucleus (MN) test on erythrocytes obtained from blood of hatched broad-snouted caiman (Caiman latirostris); non-relevant species for risk assessment.
401	Human safety (metabolism/toxicology)	Prasad et al.	2009	Clastogenic Effects of Glyphosate in Bone Marrow Cells of Swiss Albino Mice	Journal of Toxicology [J. Toxicol.]. Vol. 2009, [np]. 2009	This study applied 2 in vivo genotoxicity tests, both with obvious deviations to current guidelines. The i.p. route of exposure used for the micronucleus and chromosomal aberration assay renders the study irrelevant for human exposure.
3011	Human safety (metabolism/toxicology)	Raipulis et al.	2009	Toxicity and Genotoxicity Testing of Roundup	Proceedings of the Latvian Academy of Sciences (2009) , Vol. 63, No. 1-2, pp. 29-32	The tested Roundup BIO formulation (Monsanto, Brussels, Belgium) contains polyoxyethylene amine (POEA), which is no longer in the composition of the representative formulation.
2134	Human safety (metabolism/toxicology)	Remor et al.	2009	Occupational exposure of farm workers to pesticides: Biochemical parameters and evaluation of genotoxicity.	Environ. Int., Vol. 35, Issue 2, Page 273-278, Publication Year 2009	Evaluation of the activities of butyrylcholinesterase (BChE) and -aminolevulinic acid dehydratase (ALA-D) enzymes, hematol., lipid parameters and genotoxicity using Comet assay in peripheral blood leukocytes and a micronucleus (MN) test in oral mucosa cells of agricultural workers. 37 male pesticides appliers (sprayers) exposed since childhood to a mixture of pesticides. No definded information on exposure or subtances were given.
8	Human safety (metabolism/toxicology)	Sakamoto et al.	2007	A 52-week feeding study of genetically modified soybeans in F344 rats .	Shokuhin eiseigaku zasshi. Journal of the Food Hygienic Society of Japan, (2007 Jun) Vol. 48, No. 3, pp. 41-50.	No glyphosate data included in the article.
603	Human safety (metabolism/toxicology)	Simoniello et al.	2008	DNA damage in workers occupationally exposed to pesticide mixtures.	J. Appl. Toxicol., Vol. 28, Issue 8, Page 957-965, Publication Year 2008	Evaluation of 54 subjects occupationally exposed to a large number of pesticides (directly or indirectly) and 30 subjects as a control group using the quantification of DNA damage level by means of the alkaline Comet assay and the evaluation of repair processes.

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						No definded information on time and/or way of exposure and the exposed subtance (batch, manufacturer, analytics, adjuvants) were given.
2057	Human safety (occupational exposure)	Aleguas et al.	2007	Morbidity of Agricultural Chemical Use in Guyana	Clinical Toxicology [Clin. Toxicol.]. Vol. 45, no. 4, p. 361. May 2007	Only an abstract available without details
1716	Human safety (occupational exposure)	Colt et al.	2007	Inferring past pesticide exposures: A matrix of individual active ingredients in home and garden pesticides used in past decades.	Environmental Health Perspectives, (Feb 2007) Vol. 115, No. 2, pp. 248-254	Describes the development of an exposure classification tool to classify pesticide exposure status. Article does not report pesticide exposure status or health outcomes for any study population.
2172	Human safety (occupational exposure)	Monge et al.	2007	Parental occupational exposure to pesticides and the risk of childhood leukemia in Costa Rica.	Scandinavian Journal of Work Environment and Health, (AUG 2007) Vol. 33, No. 4, pp. 293-303	Publication describes general pesticide, exposures, general herbicide exposures, or collective exposures of "paraquat, chlorothalonil, glyphosate, and others."
2452	Human safety (occupational exposure)	Ogg	2008	Research: Pesticide Exposure Extends to Applicators Family	Crop watch (2008) , No. 8 Source Note: 2008 Apr. 25, no. 8	Non peer-reviewed web publication of University of Nebraska.
137	Human safety (occupational exposure)	Spiller et al.	2008	Agricultural chemical exposure in small farmers in Guyana.	Toxicological and Environmental Chemistry, (2008) Vol. 90, No. 2, pp. 361-365.	Publication describes general pesticide exposures (not glyphosate specific)
306	Human safety (occupational exposure)	Ugaddan et al.	2009	Brain acetylcholinesterase (AChE) activity and liver melanomacrophage centers (MMCs) formation in Nile tilapia (Oreochromis niloticus L.) following exposure to glyphosate herbicide.	Asia Life Sciences, (JAN-JUN 2009) Vol. 18, No. 1, pp. 73-85. ISSN: 0117-3375.	Study in Oreochromis niloticus L. (tilapia, a cichlid fish); not a relevant species for risk assessment. It focuses on the effects of an unidentified formulation of glyphosate on fishes (Nile tilapia), the study only refers to findings based on cellular and molecular level that cannot be related to the Ecotox risk assessment.
2648	Human safety (occupational exposure)	Zhai et al.	2008	Skin decontamination of glyphosate from human skin in vitro .	Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association, (2008 Jun) Vol. 46, No. 6, pp. 2258-60	The article is comparing three model decontaminant solutions for their ability to remove a glyphosate (only used as model herbicide) from an in vitro model. Glyphosate is only used as a control substance (not tested with different doses).
2166	Human safety (toxicology)	Perez-Herrera et al.	2008	PON1Q192R genetic polymorphism modifies organophosphorus pesticide effects on semen quality and DNA integrity in agricultural workers from southern Mexico	Toxicology and Applied Pharmacology, (2008) Vol. 230, No. 2, pp. 261-268	Semen quality of agricultural workers with general high exposure to pesticides (29 different substances), mainly focused on orhanophosphors, was investigated. No definded information on exposure or subtances were given.

6. 適合性評価の第２段階で「区分 b」「区分 c」へ分類された論文リストとその理由

表 28 適合性評価の第２段階で「区分 b」と判断した論文とその理由 （英文報告書 p.31-38 の Table 25 及び p.39-50 の Table 26）

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
243	CA 5.7	Radio et al.	2008	Assessment of Chemical Effects on Neurite Outgrowth in PC12 cells Using High Content Screening.	Toxicol. Sci., Vol. 105, Issue 1, Page 106-118, Publication Year 2008	5.4.1 case b) relevant but supplementary information: The data presented in this study provide only supportive information for the risk asessment regarding effect of glyphosate on outgrowth of neurites in differentiated Neuroscreen-1 cells.
1336	CA 5.8.1	Manas et al.	2009	Genotoxicity of AMPA, the environmental metabolite of glyphosate , assessed by the Comet assay and cytogenetic tests.	Ecotoxicology and environmental safety, (2009 Mar) Vol. 72, No. 3, pp. 834-7	5.4.1 case b) relevant but supplementary information: The publication is providing genotoxcity information on AMPA via in vitro Comet assay in Hep-2, chromosome aberration test in human lymphocytes and in vivo micronucleus test in mice. The article was downgraded to Category B due to its non-reliability.
174	CA 5.8.2	Abass et al.	2009	An evaluation of the cytochrome P450 inhibition potential of selected pesticides in human hepatic microsomes.	J. Environ. Sci. Health, Part B, Vol. 44, Issue 6, Page 553-563, Publication Year 2009	5.4.1 case b) relevant but supplementary information: The study provides only supplementary information on hepatic CYP interaction in vitro; results do not change the existing risk assessment.
332	CA 5.8.2	Chan et al.	2007	Cardiovascular effects of herbicides and formulated adjuvants on isolated rat aorta and heart.	Toxicol. in Vitro, Vol. 21, Issue 4, Page 595-603, Publication Year 2007	5.4.1 case b) relevant but supplementary information: The article is relevant for the risk assessment since it analyses the effects on cardiovascular cells exposed to glyphosate technical grade. Although only additional information is provided for the risk assessment.
598	CA 5.8.2	Hultberg et al.	2007	Cysteine turnover in human cell lines is influenced by glyphosate .	Environmental Toxicology and Pharmacology, (JUL 2007) Vol. 24, No. 1, pp. 19-22	5.4.1 case b) relevant but supplementary information: The article is providing only supplementary information for the risk assessment regarding the effect of Glyphosate to intra and extra cellular cysteine and glutathione levels.
1296	CA 5.8.2	Mclaughlin et al.	2008	Functional expression and comparative characterization of nine murine cytochromes P 450 by fluorescent inhibition screening	Drug Metabolism and Disposition, (2008) Vol. 36, No. 7, pp. 1322-1331	5.4.1 case b) relevant but supplementary information: The data presented in this study provide only supportive information for the risk asessment regarding potential interaction of glyphosate with mouse and human P450s involved in xenobiotic metabolism.
155	CA 5.8.3	Hokanson et al.	2007	Alteration of estrogen-regulated gene expression in human cells induced by the agricultural and horticultural herbicide glyphosate .	Human and experimental toxicology, (2007 Sep) Vol. 26, No. 9, pp. 747-52	5.4.1 case b) relevant but supplementary information: The toxicity of glyphosate poduct (15%) was examined as a function of its capacity to alter gene expression (29 up and down regulated genes) in the presence or absence of estrogen. Temporal altered gene expression is not a biomarker for toxicity, but rather, may be within the range of normal biological responses of homeostasis. In vitro cytotoxicity of surfactants, however, is a significant confounder in data interpretation. Data do not reflect real in vivo exposure situations, and therefore only provides supporting information for human risk assessment purposes.

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載誌名、号、ページ等	判断理由
297	CA 5.9.4.	Bolognesi et al.	2009	Biomonitoring of genotoxic risk in agricultural workers from five colombian regions: association to occupational exposure to glyphosate .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 986-97	5.4.1 case b) relevant but supplementary information: This article was downgraded to Category B due to its non-reliability. This publication is considered relevant for the risk assessment of glyphosate, but as supplementary material, and as not reliable. Information necessary to classify health outcome was not collected at the individual participant level; it is not possible to assess the health outcome in relation to any exposure using the results reported in this study. Additionally, exposure classification was based on self-reported glyphosate exposure, an indirect method by which to estimate exposure status of study participants. No biological evidence is provided to support exposure classification of study participants. Misclassification of either exposure, outcome, or both is possible in this study.
2270	CA 5.9.4.	Caldas et al.	2008	Poisonings with pesticides in the Federal District of Brazil.	Clin. Toxicol., Vol. 46, Issue 10, Page 1058-1063, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
108	CA 5.9.4.	Calvert et al.	2008	Acute pesticide poisoning among agricultural workers in the United States, 1998-2005.	American Journal of Industrial Medicine, (December 2008) Vol. 51, No. 12, pp. 883-898	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2198	CA 5.9.4.	Dasgupta et al.	2007	Pesticide poisoning of farm workers-implications of blood test results from Vietnam.	Int. J. Hyg. Environ. Health, Vol. 210, Issue 2, Page 121-132, Publication Year 2007	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
377	CA 5.9.4.	Firth et al.	2007	Chemical exposure among NZ farmers.	International journal of environmental health research, (2007 Feb) Vol. 17, No. 1, pp. 33-43	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2208	CA 5.9.4.	Horiuchi et al.	2008	Pesticide-related dermatitis in Saku district, Japan, 1975-2000.	International journal of occupational and environmental health, (2008 Jan-Mar) Vol. 14, No. 1, pp. 25-34	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
136	CA 5.9.4.	Naidoo et al.	2008	Agricultural activities, pesticide use and occupational hazards among women working in small scale farming in Northern KwaZulu-Natal, South Africa.	Int. J. Occup. Environ. Health, Vol. 14, Issue 3, Page 218-224, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
3281	CA 5.9.4.	Recena et al.	2006	Pesticides exposure in Culturama, Brazil-Knowledge, attitudes, and practices	Environmental Research, (2006) Vol. 102, No. 2, pp. 230-236	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2416	CA 5.9.4.	Sanin et al.	2009	Regional differences in time to pregnancy among fertile women from five Colombian regions with different use of glyphosate .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 949-60	5.4.1 case b) relevant but supplementary information: This article was downgraded to Category B due to its non-reliability. This publication is considered relevant for the risk assessment of glyphosate, but as supplementary material, and as not reliable.

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
						Information necessary to classify health outcome was not collected at the individual participant level; no biological evidence is provided to support exposure classification of study participants. Misclassification of exposure is possible in this study. It is not possible to assess the health outcome in relation to exposure using the results reported in this study.
1257	CA 5.9.4.	Settimi et al.	2008	Findings from the Italian Program for Surveillance of Acute Pesticide-related Illness, 2005	Clinical Toxicology [Clin. Toxicol.], (20080600) vol. 46, no. 5, p. 388	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2418	CA 5.9.4.	Sudakin et al.	2009	Regional variation in the severity of pesticide exposure outcomes: applications of geographic information systems and spatial scan statistics	Clinical Toxicology, (2009) Vol. 47, No. 3, pp. 248-252	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
1006	CA 6.5.3	Saka et al.	2008	Effects of processing and cooking on the levels of pesticide residues in soybean samples.	Shokuhin Eiseigaku Zasshi, (JUN 2008) Vol. 49, No. 3, pp. 160-167.	5.4.1 case b) relevant but supplementary information: It provides the information on Pfs that can be used supportive of setting the MRLs. However, in the current Japanese MRL setting system, the MRL for soybean is set for RAC and Pfs for soy bean products are not reflected into the dietary risk assessment.
1231	CA 7.1.2	Simonsen et al.	2008	Fate and availability of glyphosate and AMPA in agricultural soil .	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2008 Jun) Vol. 43, No. 5, pp. 365-75	5.4.1 case b) relevant but supplementary information: The experimental setup and analytical method are quite well described. The study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Tested soil was not glyphosate free.
623	CA 7.1.2 CA 7.1.3.1	Mamy et al.	2007	Desorption and time-dependent sorption of herbicides in soils	European journal of soil science (2007) , Vol. 58, No. 1, pp. 174-187	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method are quite well described. The study has some deficiencies and results are not presented in detail. Thus, endpoints cannot be verified.
1000	CA 7.1.3.1	Caceres-Jensen et al.	2009	Adsorption of glyphosate on variable-charge, volcanic ash-derived soils .	Journal of environmental quality, (2009 Jul-Aug) Vol. 38, No. 4, pp. 1449-57	5.4.1 case b) relevant but supplementary information: Volcanic ash soils were investigated. These are not relevant for EU but can be relevant for Japan. The experimental setup is quite well described. The study has some deficiencies and results are not presented in detail. Thus, endpoints cannot be verified.
1576	CA 7.1.3.1	Farenhorst et al.	2008	Herbicide sorption coefficients in relation to soil properties and terrain attributes on a cultivated prairie.	Journal of environmental quality, (2008 May-Jun) Vol. 37, No. 3, pp. 1201-8	5.4.1 case b) relevant but supplementary information: The article investigated the adsorption of glyphosate on soil. 287 surface soils (0–15 cm) collected in a 10 × 10 m grid across a heavily eroded, undulating, calcareous prairie landscape in Minnesota (U.S.). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Adsorption coefficients are only presented a mean values for respective slopes of the sampling location. The study is considered not reliable.

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1722	CA 7.1.3.1	Accinelli et al.	2006	Influence of Cry1Ac toxin on mineralization and bioavailability of glyphosate in soil .	Journal of agricultural and food chemistry (2006) , Vol. 54, No. 1, pp. 164-169	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
1896	CA 7.1.3.1	Candela et al.	2007	Laboratory studies on glyphosate transport in soils of the Maresme area near Barcelona, Spain: Transport model parameter estimation.	Geoderma, (JUN 15 2007) Vol. 140, No. 1-2, pp. 8-16	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
2669	CA 7.1.3.1	Sorensen et al.	2006	Sorption , desorption and mineralisation of the herbicides glyphosate and MCPA in samples from two Danish soil and subsurface profiles.	Environmental pollution (2006) , Vol. 141, No. 1, pp. 184-194	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. One soil site was heavily used for agriculture in the past - the usage of glyphosate is likely. Thus, endpoints cannot be verified. Experiments were performed at 10° C. Additionally, no parental mass balance was established.
2671	CA 7.1.3.1	Al-Rajab et al.	2008	Sorption and leaching of 14 C-glyphosate in agricultural soils	Agronomy for Sustainable Development (Jul 2008) Vol. 28, No. 3, pp. 419-428	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. However, details in the method description are unclear (especially equilibration time). Study has some deficiencies and results are not presented in details. Additionally, no parental mass balance was established. Thus, endpoints cannot be verified.
3128	CA 7.1.3.1	Jacobsen et al.	2008	Variation of MCPA, metribuzine, methyltriazine-amine and glyphosate degradation, sorption, mineralization and leaching in different soil horizons.	Environ. Pollut. (Oxford, U. K.), Vol. 156, Issue 3, Page 794-802, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Experiments were performed at 10° C and only one concentration was used. Additionally, no parental mass balance was established.
3130	CA 7.1.3.1	Farenhorst et al.	2009	Variations in soil properties and herbicide sorption coefficients with depth in relation to PRZM (pesticide root zone model) calculations	Geoderma (2009) , Vol. 150, No. 3-4, pp. 267-277 Source Note: 2009 May 15, v. 150, issue 3-4	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Additionally, no parental mass balance was established. Thus, endpoints cannot be verified.
1010	CA 7.1.3.1	Laitinen et al.	2008	Effects of soil phosphorus status on environmental risk assessment of glyphosate and glufosinate-ammonium.	J. Environ. Qual., Volume 37, Issue 3, Page 830-838, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described, however several details are not reported (e.g. which phase was analysed). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
2174	CA 7.1.3.1.1	Gjettermann et	2009	Particle-facilitated pesticide leaching	Journal of environmental quality,	5.4.1 case b) relevant but supplementary information:

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	CA 7.1.3.1.2	al.		from differently structured soil monoliths.	(2009 Nov-Dec) Vol. 38, No. 6, pp. 2382-93	Experimental setup and analytical method quite well described, however several details are not reported (e.g. which phase was analysed). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
2026	CA 7.1.4.2	Grundmann et al.	2008	Mineralization and Transfer Processes of 14C-labeled Pesticides in Outdoor Lysimeters	Water, air and soil pollution. Focus (2008) , Vol. 8, No. 2, pp. 177-185	5.4.1 case b) relevant but supplementary information: The study has several deficinecies. Furthermore, experimental set-up and analytical results are not described in detail.
1442	CA 7.1.4.3	Laitinen et al.	2009	Glyphosate and phosphorus leaching and residues in boreal sandy soil	PLANT AND SOIL, (OCT 2009) Vol. 323, No. 1-2, Sp. iss. SI, pp. 267-283	5.4.1 case b) relevant but supplementary information: The study does not represent worst case condition. The study period was dry in the whole Southern and Central Finland causing exceptionally low groundwater table levels and droughts in spring 2003. During the whole study the total precipitation was 867 mm in the experimental field, representing 80% of the long-term precipitation. Furthermore, the leaching field was situated in an intensively cultivated region, where the use of glyphosate is common.
1238	CA 7.2.1.2	Chen et al.	2007	Fe(III)-pyruvate and Fe(III)-citrate induced photodegradation of Glyphosate in aqueous solutions	Journal of Coordination Chemistry, (2007) Vol. 60, No. 22, pp. 2431-2439	5.4.1 case b) relevant but supplementary information: The article shows that glyphosate is stable to photolysis at wavelengths ≥365 nm. According to the guideline, wavermength ≥290 nm should be investigated.
644	CA 7.5	Popp et al.	2008	Determination of glyphosate and AMPA in surface and waste water using high-performance ion chromatography coupled to inductively coupled plasma dynamic reaction cell mass spectrometry (HPIC-ICP-DRC-MS)	Analytical and bioanalytical chemistry (2008) , Vol. 391, No. 2, pp. 695-699	5.4.1 case b) relevant but supplementary information: Details on sampling like exact location, timing, duration and sampling method are not available. Therefore, results cannot be related to the application schedule of glyphosate. Furthermore, available information on the analytical method and its validation does not allow for a full assessment of its acceptability.
23	CA 8.1.4 CA 8.2.8	Relyea et al.	2009	A cocktail of contaminants: how mixtures of pesticides at low concentrations affect aquatic communities .	Oecologia, (2009 Mar) Vol. 159, No. 2, pp. 363-76	5.4.1 case b) relevant but supplementary information: Provides information on the effects of glyphosate on phytoplankton, zooplankton and periphyton and larval development of ambphibians but no risk assessment relevant endpoints are presented.
996	CA 8.1.5	Quassinti et al.	2009	Effects of paraquat and glyphosate on steroidogenesis in gonads of the frog Rana esculenta in vitro	Pesticide biochemistry and physiology (2009) , Vol. 93, No. 2, pp. 91-95	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
1601	CA 8.2.1	Ayoola et al.	2008	Histopathological effects of glyphosate on juvenile African catfish (Clarias	American-Eurasian Journal of Agricultural and Environmental	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important

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				gariepinus).	Science (2008) , Vol. 4, No. 3, pp. 362-367	methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3269	CA 8.2.1	Carriquiriborde et al.	2006	Ecotoxicological studies on the pejerrey (Odontesthes bonariensis, Pisces Atherinopsidae).	Biocell, (2006) Vol. 30, No. 1, pp. 97-109	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3024	CA 8.2.1 / CP 10.2.1	Ayoola et al.	2008	Toxicity of glyphosate herbicide on Nile tilapia (Oreochromis niloticus) juvenile.	African Journal of Agricultural Research (2008) , Vol. 3, No. 12, pp. 825-834	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
197	CA 8.2.4.1 CA 8.2.4.2	Dominguez-Cortinas et al.	2008	Analysis of the toxicity of glyphosate and Faena (R) using the freshwater invertebrates Daphnia magna and Lecane quadridentata.	Toxicological and Environmental Chemistry, (2008) Vol. 90, No. 2, pp. 377-384	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
1119	CA 8.2.4.1 CA 8.2.4.2	Melnichuk et al.	2007	Estimation of toxicity of glyphosate - based herbicides by biotesting method using Cladocera.	Hydrobiological Journal, (2007) Vol. 43, No. 3, pp. 80-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3028	CA 8.2.4.2 CA 8.2.5.2	Achiorno et al.	2008	Toxicity of the herbicide glyphosate to Chordodes nobilii (Gordiida, Nematomorpha).	Chemosphere, (2008 May) Vol. 71, No. 10, pp. 1816-22	5.4.1 case b) relevant but supplementary information: Data on adult mortality are not relevant, because the test was conducted with a Roundup formulation. The endpoint for larvae is based on infective capacity (of previously exposed larvae or embryos) for which significant differences compared to control were demonstrated at all tested concentrations. Therefore, a LOEC is the only endpoint that can be established from this study and a LOEC cannot be used in the aquatic RA. Results are considered

ID	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
						as only supportive.
939	CA 8.2.4.2 CA 8.2.5.2	Melnichuk et al.	2007	Effects of Fakel herbicide on vital activity of Ceriodaphnia affinis in acute and chronic experiments.	Hydrobiological Journal, (2007) Vol. 43, No. 6, pp. 83-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
2945	CA 8.2.5.1	Papchenkova et al.	2009	The parameters of reproduction , sizes, and activities of hydrolases in Daphnia magna straus of successive generations affected by Roundup herbicide.	Inland Water Biology, (JUL 2009) Vol. 2, No. 3, pp. 286-291	5.4.1 case b) relevant but supplementary information: The article shows significant effects compared to the control for some variables and no effects for some other, so no clear endpoint from this study can be used for the risk assessment. Results are considered as only supportive.
751	CA 8.2.6.2	Ruan et al.	2008	Effects of acute glyphosate exposure on the growth and physiology of Nostoc sphaeroides, an edible cyanobacterium of paddy rice fields.	Acta Hydrobiologica Sinica, (JUL 2008) Vol. 32, No. 4, pp. 462-468	5.4.1 case b) relevant but supplementary information: Taking into account that the sampling dates and measured variables do not comply with guidelines, the results of the study are considered only as supportive/supplementary.
698	CA 8.2.7	Nielsen et al.	2007	Direct and indirect effects of the herbicides Glyphosate , Bentazone and MCPA on eelgrass (Zostera marina).	Aquatic toxicology (Amsterdam, Netherlands), (2007 Apr 20) Vol. 82, No. 1, pp. 47-54	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
2915	CA 8.2.7 CP 10.2.1	Turgut et al.	2006	The impact of pesticides toward parrotfeather when applied at the predicted environmental concentration	Chemosphere (2006), Vol. Date 2007, 66(3), 469-473	5.4.1 case b) relevant but supplementary information: The article shows significant effects compared to the control at the only tested rate for some variables and no effects for some other, so no clear endpoint from this study can be used for the risk assessment. Results are considered as only supportive.
997	CA 8.2.8	Widenfalk et al.	2008	Effects of pesticides on community composition and activity of sediment microbes --responses at various levels of microbial community organization.	Environmental pollution (Barking, Essex : 1987), (2008 Apr) Vol. 152, No. 3, pp. 576-84	5.4.1 case b) relevant but supplementary information: Detected effects of this study are based on molecular methods that cannot be univocally integrated in the risk assessment. In addition a LOEC cannot be used in the aquatic RA. The article failed to demonstrate effects of glyphosate exposure on community-level endpoints of sediment microorganisms (bacterial activity, fungal and total microbial biomass). Results are considered as only supportive.
251	CA 8.2.8	Bonnet et al.	2007	Assessment of the potential toxicity of herbicides and their degradation products to nontarget cells using two microorganisms , the bacteria Vibrio	Environmental toxicology, (2007 Feb) Vol. 22, No. 1, pp. 78-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or

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				fischeri and the ciliate Tetrahymena pyriformis.		substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3017	CA 8.2.8	Hernando et al.	2007	Toxicity evaluation with Vibrio fischeri test of organic chemicals used in aquaculture.	Chemosphere, Vol. 68, Issue 4, Page 724-730, Publication Year 2007	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
2504	CA 8.2.8	Pesce et al.	2009	Response of spring and summer riverine microbial communities following glyphosate exposure .	Ecotoxicology and environmental safety, (2009 Oct) Vol. 72, No. 7, pp. 1905-12	5.4.1 case b) relevant but supplementary information: Although at 10 µg/L no differences between treated and control were detected for chlorophyl content and biomass data (i.e. NOEC), the study does show effects in the community composition at that concentration for the higher temperature. In the treated microcosms, three algal genera (Asterionella, Cyclotella and Oocystis) disappeared between day 0 and day 3. Therefore, a LOEC is the only endpoint that can be established from this microcosm study and a LOEC cannot be used in the aquatic RA. Results are considered as only supportive.
875	CA 8.4	Yasmin et al.	2007	Effect of pesticides on the reproductive output of Eisenia fetida .	Bulletin of environmental contamination and toxicology, (2007 Nov) Vol. 79, No. 5, pp. 529-32	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
1140	CA 8.4.2	Ruan et al.	2009	Evaluation of Pesticide Toxicities with Differing Mechanisms Using Caenorhabditis elegans.	J. Toxicol. Environ. Health, Part A, Vol. 72, Issue 11 and 12, Page 746-751, Publication Year 2009	5.4.1 case b) relevant but supplementary information: No endpoints (NOEC, LOEC, Ecx) are provided, but some findings of the work (generation time, brood size) could serve to investigate sub-lethal effects of glyphosate on non macro-soil organisms as part of a broader discussion.
169	CA 8.5	Przybulewska et al.	2008	An attempt to determine the resistance of microorganisms from triazine-contaminated soils to different herbicide groups.	Ecol. Chem. Eng. S, Vol. 15, Issue 3, Page 359-374, Publication Year 2008	5.4.1 case b) relevant but supplementary information: No endpoints are provided. Although this publication provides information about effects of high concentrations of Roundup 360 SL formulation (representative EU formulation) in soil on micro-organisms, the results are shown only in form of graphs and no detailed results are presented. Therefore the results of the study are considered only as supportive/supplementary.
3022	CP 10.2.1	Erms et al.	2009	Toxicity of glyphosate and ethoxysulfuron to the green microalgae (Scenedesmus	Asian Journal of Chemistry (2009) , Vol. 21, No. 3, pp. 2163-	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	判断理由
				obliquus).	2169	methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
978	CP 10.5	Mijangos et al.	2009	Effects of glyphosate on rhizosphere soil microbial communities under two different plant compositions by cultivation-dependent and -independent methodologies	Soil biology and biochemistry (2009) , Vol. 41, No. 3, pp. 505-513	5.4.1 case b) relevant but supplementary information: The article still shows significant effects compared to the control at the lowest tested rate under some of the tested scenarios, so no clear endpoint from this study can be used for the risk assessment. In addition, glyphosate effect is not the only and single tested variable. Results are considered as only supportive.
3090		Curwin et al.	2007	Urinary pesticide concentrations among children, mothers and fathers living in farm and non-farm households in iowa.	The Annals of occupational hygiene, (2007 Jan) Vol. 51, No. 1, pp. 53-65	5.4.1 case b) relevant but supplementary information: Biomonitoring in Urine of farmer children, concentration in urine samples is only reported, likely not relevant or only supportive. Not relevant information for risk assessment but relevant for the dossier.

表 29 適合性評価の第 2 段階で「区分 c」と判断した論文とその理由 （英文報告書 p.51-52 の Table 27 及び p.53-54 の Table 28）

Submission Number	データ要求 (項目番号)	著者	出 版 年	論文表題	掲載誌名、号、ページ等	判断理由
601	CA 5.4.1	Sivikova et al.	2006	Cytogenetic effect of technical glyphosate on cultivated bovine peripheral lymphocytes.	International Journal of Hygiene and Environmental Health (2006) , Vol. 209, No. 1, pp. 15-20	5.4.1 case c) unclear relevance for the following reason: The paper is about an in vitro CA and SCE study on bovine lymphocytes exposed to a glyphosate formulation for 2h with metabolic activation and 24h and 48 h without metabolic activation. A glyphosate product (glyphosate , approximate 62% by weight) with 3
2194	CA 5.9.1	Curwin et al.	2007	Pesticide dose estimates for children of Iowa farmers and non-farmers.	Environmental research, (2007 Nov) Vol. 105, No. 3, pp. 307-15	5.4.1 case c) unclear relevance for the following reason: The study is providing only supplementary information for the risk assessment regarding biomonitoring data (urine) for children of farmers and non-farmers.
1545	CP 7.1.7	Malatesta et al.	2008	Hepatoma tissue culture (HTC) cells as a model for investigating the effects of low concentrations of herbicide on cell structure and function.	Toxicology in vitro : an international journal published in association with BIBRA, (2008 Dec) Vol. 22, No. 8, pp. 1853-60	5.4.1 case c) unclear relevance for the following reason: In vitro study with Glyphosate formulation of unknown composition investigating the effects on modifications in mitrochondrial functions and transcription/splicing pathways in hepatocytes. Pure active substance was not tested.
917	CA 8.3.2	Addison et al.	2006	Effect of various pesticides on the non-target species Microctonus hyperodae, a biological control agent of Listronotus bonariensis.	Entomologia Experimentalis et Applicata (2006) Vol. 119, No. 1, pp. 71-79	5.4.1 case c) unclear relevance for the following reason: Study provides information on effects of a Roundup formulation on the parasitoid wasp Microtonus hyperodae. As the exposure situation in the test (exposure via shaking in test solution) is not comparable to the field situation (overspray or exposure to residues) and study condtions are not mentioned the relevance of the study cannot be clearly determined.
430	CP 7.1.7	Dimitrov et al.	2006	Comparative genotoxicity of the herbicides Roundup, Stomp and Reglone in plant and mammalian test systems.	Mutagenesis, (2006 Nov) Vol. 21, No. 6, pp. 375-82. Electronic Publication Date: 23 Sep 2006	5.4.1 case c) unclear relevance for the following reason: The study is providing only supplementary information for the risk assessment. Furthermore, no information on Roundup formulation (batch, adjuvants, expiration date, storage, analytics, purchaser) are given. There are uncertainties whether the test concentrations are in physiologically acceptable range (< 1mM) and the active ingredient content in oral doses is unclear.
1335	CP 7.1.7	Heydens et al.	2008	Genotoxic potential of glyphosate formulations: mode - of - action investigations.	Journal of agricultural and food chemistry, (2008 Feb 27) Vol. 56, No. 4, pp. 1517-23	5.4.1 case c) unclear relevance for the following reason: Genotox data on non-representative glyphosate formulation of unknown composition; relevance uncertain; Publication, no guideline/GLP study/mode of action study: clarifying contradictory results from other genotoxicity studies
1182	CP 7.1.7	Holeckova et al.	2006	Evaluation of the in vitro effect of glyphosate -based herbicide on bovine lymphocytes using chromosome painting.	Bulletin of the Veterinary Institute in Puawy (2006) , Vol. 50, No. 4, pp. 533-536	5.4.1 case c) unclear relevance for the following reason: The induction of bovine chromosome 1 aberrations was investigated in cultivated peripheral lymphocytes of cattle after an application of a glyphosate-based herbicide formulation. A glyphosate product (glyphosate , approximate 62% by weight) with 38% inert

7．適合性評価の第２段階で「区分 a 」と判断した論文リスト及び信頼性を評価した結果

表 30 適合性評価の第２段階で「区分 a」と判断した論文リスト及び信頼性を評価した結果 （英文報告書 p.27-28 の Table 23 及び p.29-30 の Table 24）

Submission Number	データ要求 (項目番号)	著者	出版年	論文表題	掲載詩名、号、ページ等	信頼性分類	判断理由
3031	CA 5.1.1	Anadon et al.	2009	Toxicokinetics of glyphosate and its metabolite aminomethyl phosphonic acid in rats .	Toxicology letters, (2009 Oct 08) Vol. 190, No. 1, pp. 91-5	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
140	CA 5.9.4.	Andreotti et al.	2009	Agricultural pesticide use and pancreatic cancer risk in the Agricultural Health Study Cohort.	International Journal of Cancer, (15 May 2009) Vol. 124, No. 10, pp. 2495-2500	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2209	CA 5.9.4.	Hoppin et al.	2006	Pesticides and adult respiratory outcomes in the agricultural health study.	Ann. N. Y. Acad. Sci., Vol. 1076, Issue Living in a Chemical World, Page 343-354, Publication Year 2006	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2206	CA 5.9.4.	Lee et al.	2007	Pesticide use and colorectal cancer risk in the Agricultural Health Study.	Int. J. Cancer, Vol. 121, Issue 2, Page 339-346, Publication Year 2007	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
1697	CA 5.9.4.	Weselak et al.	2007	In utero pesticide exposure and childhood morbidity.	Environmental Research, (JAN 2007) Vol. 103, No. 1, pp. 79-86	1	5.4.1 case a) relevant and provides data for the risk assessment: This was a retrospective cohort study conducted in Canada as part of the Ontario Farm Family Health Study (OFFHS). A short summary for this article is provided.
2196	CA 5.9.4.	Eriksson et al.	2008	Pesticide exposure as risk factor for non-Hodgkin lymphoma including histopathological subgroup analysis.	International journal of cancer, (2008 Oct 01) Vol. 123, No. 7, pp. 1657-63.	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3084	CA 8.1.4 CA 8.7	Rohr et al.	2008	Understanding the net effects of pesticides on amphibian trematode infections.	Ecological applications : a publication of the Ecological Society of America, (2008 Oct) Vol. 18, No. 7, pp. 1743-53	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3012	CA 8.2.1	Langiano Vivian Do Carmo et al.	2008	Toxicity and effects of a glyphosate - based herbicide on the Neotropical fish Prochilodus lineatus.	Comparative biochemistry and physiology. Toxicology and pharmacology : CBP, (2008 Mar) Vol. 147, No. 2, pp. 222-31	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
1124	CA 8.2.1 CA 8.2.2	Stehr et al.	2009	Evaluating the Effects of Forestry Herbicides on Fish Development Using Rapid Phenotypic Screens	North American Journal of Fisheries Management [N. Am. J. Fish. Manage.]. Vol. 29, no. 4, pp. 975-984. Aug 2009	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3016	CA 8.2.4.1	Pereira et al.	2009	Toxicity evaluation of three pesticides on	Ecotoxicology (London,	1	5.4.1 case a) relevant and provides data for the risk

Submission Number	データ要求 (項目番号)	著者	出 版 年	論文表題	掲載詩名、号、ページ等	信頼性分類	判断理由
	CA 8.2.6.1			non-target aquatic and soil organisms: commercial formulation versus active ingredient.	England), (2009 May) Vol. 18, No. 4, pp. 455-63		assessment: A summary for this article is provided.
100	CA 8.2.4.2 CA 8.2.5.2	Bringolf et al.	2007	Acute and chronic toxicity of glyphosate compounds to glochidia and juveniles of Lampsilis siliquoidea (Unionidae).	Environmental toxicology and chemistry, (2007 Oct) Vol. 26, No. 10, pp. 2094-100	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
834	CA 8.2.6.1	Vendrell et al.	2009	Effect of glyphosate on growth of four freshwater species of phytoplankton: a microplate bioassay.	Bulletin of environmental contamination and toxicology, (2009 May) Vol. 82, No. 5, pp. 538-42	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
413	CP 10.6.2 CA 8.2.7 CA 8.2.6.1	Cedergreen et al.	2007	Combination effects of herbicides on plants and algae: do species and test systems matter?	Pest Management Science (2007), 63(3), 282-295	1	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

8. EFSA, USEPA, JMPR の評価において評価書に結果が引用されている場合は、引用した機関、引用された評価書名、発行年等の情報

表 31 EFSA, USEPA, JMPR の評価書に引用されている論文

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載誌名、号、ページ等	評価機関	評価書情報（発行年等）	備考
FE 001	II 5	Ackermann W, et al.	2015	The influence of glyphosate on the microbiota and production of botulinum neurotoxin during ruminal fermentation.	Curr Microbiol.. 70(3):374–82	JMPR	2016, Part II	
FE 002	II 5	Acquavella JF, et al.	1999	Human ocular effects from self-reported exposure to Roundup herbicides.	Hum Exp Toxicol. 18: 479–86.	JMPR	2016, Part II	
FE 003	II 5	Acquavella JF, et al.	2004	Glyphosate biomonitoring for farmers and their families: results from the Farm Family Exposure Study.	Environ Health Perspec.112:321–6.	JMPR	2016, Part II	
FE 004	II 5	Akcha, F., et al.	2012	Genotoxicity of diuron and glyphosate in oyster spermatozoa and embryos.	Aquatic Toxicol. 106-107: 104-113.	USEPA	2015, 417701	
FE 005	II 5	Alavanja MC, et al.	2004	Pesticides and lung cancer risk in the agricultural health study cohort.	Am J Epidemiol. 160(9):876–85.	JMPR	2016, Part II	
FE 006	II 5	Alavanja MC, et al.	2014	Non-Hodgkin lymphoma risk and insecticide, fungicide and fumigant use in the agricultural health study.	PLoS ONE. 9:e109332. doi:10.1371/journal.pone.0109332	JMPR	2016, Part II	
FE 007	II 5	Alavanja, M. C., et al.	2003	Use of agricultural pesticides and prostate cancer risk in the Agricultural Health Study cohort.	Am J Epidemiol, 157(9), 800-814.	USEPA	2014, D417808	
FE 008	II 5	Alavanja, M. C., et al.	2004	Pesticides and lung cancer risk in the agricultural health study cohort.	Am J Epidemiol, 160(9), 876-885. doi: 160/9/876 [pii]10.1093/aje/kwh290	USEPA	2014, D417808	
FE 009	II 5	Alison RH, et al.	1994	Neoplastic lesions of questionable significance to humans.	Toxicol Pathol. 22;179–86.	JMPR	2016, Part II	
FE 010	II 7	Al-Rajab, Abdul Jabbar and Michael Schiavon	2010	Degradation of 14C-glyphosate and aminomethylphosphonic acid (AMPA) in three agricultural soils.	Journal of Agricultural Sciences. 22(9):1374-1380.	USEPA	2015, 417701	
FE 011	II 5	Alvarez-Moya C, et al.	2014	Comparison of the in vivo and in vitro genotoxicity of glyphosate isopropylamine salt in three different organisms.	Genetics and Molecular Biology, 37, 1, 105- 110	JMPR USEPA	2016, Part II 2017, D444689	
FE 012	II 5	Amer SM, et al.	2006	In vitro and in vivo evaluation of the genotoxicity of the herbicide glyphosate in mice.	B Natl Res Cent (Cairo). 31:427–46.	JMPR	2016, Part II	
FE 013	II 5	Amerio, P., et al.	2004	Skin toxicity from glyphosate-surfactant formulation.	J Toxicol Clin Toxicol, 42(3), 317-319.	USEPA	2014, D417808	
FE 014	II 8	Amy Blankinship	2018	Response to Public Comments on the Preliminary Ecological Risk Assessment for Glyphosate	EPA-HQ-OPP-2009-0361-2341 dated November 21, 2018	USEPA	2020 ID	
FE	II 5	Anadón A, et al	2009	Toxicokinetics of glyphosate and its metabolite	Toxicology letters, (2009 Oct 08) Vol. 190, No. 1, pp. 91-5.	JMPR	2016, Part II	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載誌名、号、ページ等	評価機関	評価書情報（発行年等）	備考
015				aminomethyl phosphonic acid in rats.	Electronic Publication Date: 14 Jul 2009			
FE 016	II 5	Andreotti, G., et al.	2009	Agricultural pesticide use and pancreatic cancer risk in the Agricultural Health Study Cohort.	Int J Cancer, 124(10), 2495-2500. doi: 10.1002/ijc.24185	USEPA	2014, D417808 2017, D444689	
FE 017	II 5	Andreotti, G., et al.	2018	Glyphosate use and cancer incidence in the Agricultural Health Study.	JNCI: Journal of the National Cancer Institute. 110(5): 509–516. doi:10.1093/ jnci/djx233. https://academic.oup.com/jnci/article/110/5/509/4590280	USEPA	2017, D444689 2020, D455531	
FE 018	II 5	Arbuckle, T. E., et al.	2001	An exploratory analysis of the effect of pesticide exposure on the risk of spontaneous abortion in an Ontario farm population.	Environmental Health Perspectives, 109(8), 851-857.	USEPA	2014, D417808	
FE 019	II 5	Ashby J, et al.	1989	Classification according to chemical structure, mutagenicity to Salmonella and level of carcinogenicity of a further 42 chemicals tested for carcinogenicity by the U.S. National Toxicology Program.	Mutat Res. 223(2):73–103.	JMPR	2016, Part II	
FE 020	II 5	Axelrad JC, et al.	2003	The effects of acute pesticide exposure on neuroblastoma cells chronically exposed to diazinon.	Toxicology. 185:67–78.	JMPR	2016, Part II	
FE 021	II 7	Baker, N.T., et al.	2006	Occurrence and Transport of Agricultural Chemicals in Leary Weber Ditch Basin, Hancock County, Indiana, 2003- 2004. 2005 National Water Quality Assessment Program.	U.S. Department of the Interior, U.S. Geological Survey, Scientific Investigations Report, 2006	USEPA	2015, 417701	
FE 022	II 5	Baldrick P, Reeve L	2007	Carcinogenicity evaluation: comparison of tumor data from dual control groups in the CD-1 mouse.	Toxicol Pathol. 35(4):562–9.	JMPR	2016, Part II	
FE 023	II 7	Balthazor TM, Hallas LE	1986	Glyphosate-degrading microorganisms from industrial activated sludge.	Appl Environ Microbiol. 51(2):432–4.	JMPR	2016, Part II	
FE 024	II 5	Band, P. R., et al.	2011	Prostate cancer risk and exposure to pesticides in British Columbia farmers.	Prostate, 71(2), 168-183. doi: 10.1002/pros.21232	JMPR USEPA	2016, Part II 2014, D417808 2017, D444689	
FE 025	II 5	Bando, H., et al.	2010	[Extreme hyperkalemia in a patient with a new glyphosate potassium herbicide poisoning: report of a case].	Chudoku Kenkyu, 23(3), 246-249.	USEPA	2014, D417808	
FE 026	II 5	Baris, D, et al.	2001	Cohort mortality study of Philadelphia firefighters	American Journal of Industrial Medicine. 39: 463-476. doi: 10.1002/ajim.1040.	USEPA	2017, D444689	
FE 027	II 8	Barky, F. A. et al.	2012	Influence of Atrazine and Roundup Pesticides on Biochemical and Molecular Aspects of Biomphalaria alexandrina Snails.	Pesticide Biochem Physio. 104(1): 9-18	USEPA	2015, 417701	
FE	II 7	Battaglin,W.A., et	2005	GLYPHOSATE, OTHER HERBICIDES, AND	Journal of the American Water Resources Association (JAWRA),	USEPA	2015, 417701	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	評価機関	評価書情報（発行年等）	備考
028		al.		TRANSFORMATION PRODUCTS IN MIDWESTERN STREAMS, 2002	April, pp. 323-332 https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1608&context=usgsstaffpub			
FE 029	II 5	Beane Freeman LE, et al.	2005	Cancer incidence among male pesticide applicators in the Agricultural Health Study cohort exposed to diazinon.	Am J Epidemiol. 162:1070–9.	JMPR	2016, Part II	
FE 030	II 5	Benachour N, et al.	2007	Time- and dose-dependent effects of Roundup on human embryonic and placental cells.	Arch Environ Contam Toxicol. 53(1):126–33. doi:10.1007/s00244-006-0154-8.	JMPR	2016, Part II	
FE 031	II 6 / II 7	Benbrook.	2016	Trends in glyphosate herbicide use in the United States and globally.	Environmental Sciences Europe. 28(3).	USEPA	2017, D444689	
FE 032	II 5	Benjamini, Y. et al.	1995	Controlling the false discovery rate: a practical and powerful approach to multiple testing.	Journal of the Royal Statistical Society B. 57: 289-300.	USEPA	2017, D444689	
FE 033	II 8	Bernal, M. H. et al.	2009	Toxicity of Formulated Glyphosate (Glyphos) and Cosmo-Flux to Larval and Juvenile Colombian Frogs 2. Field and Laboratory Microcosm Acute Toxicity.	J. Toxicol. Environ. Health, Part A. 72(15): 966- 973	USEPA	2015, 417701	
FE 034	II 5	BfR (Bundesinstitut für Risikobewertung)	2015	Does glyphosate cause cancer?	BfR Communication No 007/2015, 23 March 2015. Available at: http://www.bfr.bund.de/cm/349/does-glyphosatecause-cancer.pdf	EFSA	2015, Conclusion	
FE 035	II 5	Blair A, et al.	2011	Impact of pesticide exposure misclassification on estimates of relative risks in the Agricultural Health Study.	Occup Environ Med. 68(7):537–41. doi:10.1136/oem.2010.059469.	JMPR	2016, Part II	
FE 036	II 5	Blakley BR	1997	Effect of roundup and tordon 202C herbicides on antibody production in mice.	Vet Hum Toxicol. 39(4):204–6.	JMPR	2016, Part II	
FE 037	II 5	Bolognesi C, et al.	1997	Genotoxic activity of glyphosate and its technical formulation roundup.	J Agric Food Chem. 45(5):1957–62.	JMPR USEPA	2016, Part II 2017, D444689	
FE 038	II 5	Bolognesi C, et al.	2009	Biomonitoring of genotoxic risk in agricultural workers from five Colombian regions: association to occupational exposure to glyphosate.	J Toxicol Environ Health A. 72(15–16):986–97.	JMPR	2016, Part II	
FE 039	II 5	Bonassi S, et al.	2001	Human MicroNucleus project: international database comparison for results with the cytokinesis-block micronucleus assay in human lymphocytes: I. Effect of laboratory protocol, scoring criteria, and host factors on the frequency of micronuclei.	Environ Mol Mutagen. 37(1):31-45.	JMPR	2016, Part II	
FE	II 5	Borenstein, M., et	2008	Introduction to Meta-Analysis.	John Wiley and Sons: London.	USEPA	2020, D455531	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	評価機関	評価書情報（発行年等）	備考
040		al.						
FE 041	II 5	Borenstein, M., et al.	2010	A basic introduction to fixed effect and random effects models for meta-analysis.	Res. Syn. Meth. 1(2):97-111. doi: 10.1002/jrsm.12. Epub 2010 Nov 21.	USEPA	2020, D455531	
FE 042	II 5	Borenstein, Michael.	2019	Common Mistakes in Meta-analysis and How to Avoid Them.	Biostat, Inc: Englewood, NJ.	USEPA	2020, D455531	
FE 043	II 8	Boutin, C., et al.	2004	Toxicity testing of fifteen non-crop plant species with six herbicides in a greenhouse experiment: implications for risk assessment.	Ecotoxicology. 13: 349-369	USEPA	2015, 417701	
FE 044	II 8	Boutin, C., et al.	2010	Measuring variability in phytotoxicity testing using crop and wild plant species.	Environ. Toxicol. Chem. 29(2): 327-337.	USEPA	2015, 417701	
FE 045	II 8	Boutin, C., et al.	2012	Phytotoxicity testing for herbicide regulation: Shortcomings in relation to biodiversity and ecosystem services in agrarian systems.	Sci. Total Environ. 415:79-92	USEPA	2015, 417701	
FE 046	II 5	Bradberry SM, et al.	2004	Glyphosate poisoning	Toxicol Rev. 23(3):159-67	JMPR USEPA	2016, Part II 2014, D417808	
FE 047	II 8	Brausch J M, et al.	2006	Pesticide usage on the southern high plains and acute toxicity of four chemicals to the fairy shrimp Thamnocephalus platyurus Crustacea: Anostraca).	Texas J Sci. 58(4):309-324.	USEPA	2015, 417701	
FE 048	II 8	Brausch JM, Beall B, Smith PN	2007	Acute and Sub-Lethal Toxicity of Three POEA Surfactant Formulations to Daphnia magna.	Bull Environ Contam Toxicol, 78, 510-514.	USEPA	2015, 417701	
FE 049	II 8	Brausch JM, Smith PN	2007	Toxicity of Three Polyethoxylated Tallowamine Surfactant Formulations to Laboratory and Field Collected Fairy Shrimp, Thamnocephalus platyurus.	Archives of Environmental Contamination and Toxicology, 52(2), 217-221.	USEPA	2015, 417701	
FE 050	II 5	Brayton et al.	2012	Pathology of aging mice and GEM background strains and experimental design.	Vet Path. 49 (1): 85-105.	USEPA	2017, D444689	
FE 051	II 5	Brewster DW, et al.	1991	Metabolism of glyphosate in Sprague–Dawley rats: Tissue distribution, identification, and quantitation of glyphosate-derived materials following a single oral dose.	Fundam Appl Toxicol. 17(1):43–51.	JMPR	2016, Part II	
FE 052	II 8	Bringolf RB, et al.	2007	Acute and Chronic Toxicity of Glyphosate Compounds to Glochidia and Juveniles of Lampsilis siliquoidea (Unionidae).	Environ Toxicol Chem. 26(10):2094-100	USEPA	2015, 417701	
FE 053	II 5	Brown LM, et al.	1990	Pesticide exposures and other agricultural risk factors for leukemia among men in Iowa and Minnesota.	Cancer Res, 50(20), 6585-6591.	JMPR USEPA	2016, Part II 2014, D417808 2017, D444689	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	評価機関	評価書情報（発行年等）	備考
FE 054	II 5	Brown, L. M., et al.	1993	Pesticide exposures and multiple myeloma in Iowa men.	Cancer Causes Control, 4(2), 153-156.	USEPA	2014, D417808 2017, D444689	
FE 055	II 5	Cantor KP, et al.	1992	Pesticides and other agricultural risk factors for non-Hodgkin's lymphoma among men in Iowa and Minnesota.	Cancer Res, 52(9), 2447-2455.	JMPR USEPA	2016, Part II 2014, D417808	
FE 056	II 5	Cantor, K.P., et al.	1993	Pesticides and Other Agricultural Risk Factors for Non-Hodgkin's Lymphoma among Men in Iowa and Minnesota.	Cancer Research 53, 2421-2421.	USEPA	2017, D444689	
FE 057	II 5	Carreon, T., et al.	2005	Gliomas and farm pesticide exposure in women: The Upper Midwest Health Study.	Environmental Health Perspectives, 113(5), 546-551. doi: 10.1289/ehp.7456	USEPA	2014, D417808 2017, D444689	
FE 058	II 6 / II 7 / II 8	Casabe, N. et al.	2007	Ecotoxicological Assessment of the Effects of Glyphosate and Chlorpyrifos in an Argentine Soya Field.	Argentine Soya Field. 7 (4): 232-239	USEPA	2015, 417701	
FE 059	II 6 / II 7 / II 8	Cerdeira A, Duke S	2006	The current status and environmental impacts of glyphosate-resistant crops: a review.	J Environ Qual. 35(5):1633–58.	JMPR	2016, Part II	
FE 060	II 5	Chan PO, Mahler JF	1992	NTP technical report on toxicity studies of glyphosate (CAS No. 1071-83-6) administered in dosed feed to F344/N rats and B6C3F1 mice.	National Toxicology Program, Research Triangle Park, NC, USA. NTP Toxicity Report Series No. 16, NIH Publication 92-3135, dated July 1992. Submitted to WHO by Monsanto Int. Services SA, Brussels, Belgium.	JMPR	2016, Part II	
FE 061	II 5	Chandra M, et al.	1992	Spontaneous neoplasms in aged Sprague-Dawley rats.	Arch Toxicol. 66:496–502.	JMPR	2016, Part II	
FE 062	II 5	Chandra M, Frith CH	1994	Spontaneous renal lesions in CD-1 and B6C3F1 mice.	Exp Toxicol Pathol. 46:189–98	JMPR	2016, Part II	
FE 063	II 5	Chang, C. B., & Chang, C. C.	2009	Refractory cardiopulmonary failure after glyphosate surfactant intoxication: a case report.	J Occup Med Toxicol, 4, 2. doi: 10.1186/1745- 6673-4-2	USEPA	2014, D417808	
FE 064	II 5	Chang, C. Y., et al.	1999	Clinical impact of upper gastrointestinal tract injuries in glyphosate-surfactant oral intoxication.	Hum Exp Toxicol, 18(8), 475-478.	USEPA	2014, D417808	
FE 065	II 5	Chang, E.T., et al.	2016	Systematic review and meta-analysis of glyphosate exposure and risk of lymphohematopoietic cancers.	Journal of environmental science and health Part B, Pesticides, food contaminants, and agricultural wastes 51, 402-434.	USEPA	2017, D444689	
FE 066	II 8	Chen L, et al.	2012	The combined effects of UV-B radiation and herbicides on photosynthesis, antioxidant enzymes and DNA damage in two bloom-forming cyanobacteria.	Ecotoxicol Environ Saf. 80:224–30.	JMPR	2016, Part II	
FE 067	II 5	Chen, H. H., et al.	2013	Spectrum of corrosive esophageal injury after intentional paraquat or glyphosatesurfactant	Int J Gen Med, 6, 677-683. doi: 10.2147/ijgm.s48273	USEPA	2014, D417808	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	評価機関	評価書情報（発行年等）	備考
				herbicide ingestion.				
FE 068	II 5	Chen, Y. J., et al.	2009	The epidemiology of glyphosatesurfactant herbicide poisoning in Taiwan, 1986-2007: a poison center study.	Clin Toxicol (Phila), 47(7), 670-677. doi: 10.1080/15563650903140399	USEPA	2014, D417808	
FE 069	II 5	Chester G, et al.	1986	Biological monitoring of a herbicide applied through backpack and vehicle sprayers.	Toxicol Lett. 33:137–49.	JMPR	2016, Part II	
FE 070	II 5	Chhabra et al	1990	An over view of prechronic and chronic toxicity/carcinogenicity experimental study designs and criteria used by the National Toxicology Program.	Environ Health Perspect. 86: 313-321.	USEPA	2017, D444689	
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FE 078	II 5	Clewell HJ, et al.	2005	Quantitative estimates of risk for noncancer endpoints.	Risk Anal. 25:285–9.	JMPR	2016, Part II	
FE 079	II 5 / II 6	Coble J, et al.	2005	The validation of a pesticide exposure algorithm using biological monitoring results.	J Occup Environ Hyg. 2:194–201.	JMPR	2016, Part II	
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FE 129	II 5 / II 6 / II 7/ II 8	Germany	2013	Renewal assessment report (RAR) on the active substance glyphosate prepared by the rapporteur Member State Germany in the framework of Regulation (EU) No 1141/2010	Available at www.efsa.europa.eu	EFSA	2015, Conclusion	
FE 130	II 5 / II 6 / II 7/ II 8	Germany	2015	Final addendum to the renewal assessment report (RAR) on the active substance glyphosate prepared by the rapporteur Member State	Available online: www.efsa.europa.eu	EFSA	2017, PR	

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FE 166	II 5	International Agency for Research on	2015	Volume 112: Some organophosphate insecticides and herbicides: tetrachlorvinphos, parathion, malathion, diazinon and glyphosate. IARC	IARC Monogr Eval Carcinog Risk Chem Hum; 3–10 March 2015.	JMPR	2016, Part II	

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				registration guidelines.				
FE 365	II 5	Whyatt, R. M., et al.	2004	Prenatal insecticide exposures and birth weight and length among an urban minority cohort.	Environ Health Perspect, 112(10), 1125-1132.	USEPA	2014, D417808	
FE 366	II 5	Wilderman, A.G. and Nazar, R.N.	1982	Significance of plant metabolism in the mutagenicity and toxicity of pesticides.	Canadian Journal of Genetics and Cytology 24(4): 437-449.	USEPA	2017, D444689	
FE 367	II 8	Williams, B. K. and R. D. Semlitsch.	2010	Larval Responses of Three Midwestern Anurans to Chronic, Low-Dose Exposures of Four Herbicides.	Arch. Environ. Contam. Toxicol. 58: 819 - 827	USEPA	2015, 417701	
FE 368	II 5	Williams, G. M., et al.	2000	Safety Evaluation and Risk Assessment of the Herbicide Roundup and Its Active Ingredient, Glyphosate, for Humans.	Regulatory Toxicology and Pharmacology 31(2): 117-165.	JMPR USEPA	2016, Part II 2017, D444689	
FE 369	II 5	Wu, J. Y., et al.	2006	Parenteral glyphosatesurfactant herbicide intoxication.	Am J Emerg Med, 24(4), 504-506. doi:10.1016/j.ajem.2005.12.002	USEPA	2014, D417808	
FE 370	II 8	Wyrill III, J.B., and Burnside, O.C.	1977	Glyphosate toxicity to common milkweed and hemp dogbane as influenced by surfactants.	Weed Science Society of America. 25(3): 275-287.	USEPA	2015, 417701	
FE 371	II 8	Xie L,et al.	2005	Evaluation of estrogenic activities of aquatic herbicides and surfactants using an rainbow trout vitellogenin assay.	Toxicol Sci. 87(2):391–8. doi:10.1093/toxsci/kfi249.	JMPR	2016, Part II	
FE 372	II 5	Yauk et al.,	2015	Approaches to identifying germ cell mutagens: Report of the 2013 IWGT workshop on germ cell assays.	Mutat Res Genet Toxicol Environ Mutagen, 783: 36-54.	USEPA	2017, D444689	
FE 373	II 5	Yiin, J. H., et al.	2012	The Upper Midwest Health Study: a case-control study of pesticide applicators and risk of glioma.	Environ Health, 11, 39. doi: 10.1186/1476-069X-11-39	USEPA	2014, D417808 2017, D444689	
FE 374	II 5	Yoo, S., & BS., K.	2010	Glyphosate Induced Severe Tublulo-Interstitial Nephritis Requiring Hemodialysis.	The Korean Journal of Nephrology, 158-161.	USEPA	2014, D417808	
FE 375	II 5	Zahm SH, et al.	1990	A case-control study of non-Hodgkin's lymphoma and the herbicide 2,4- dichlorophenoxyacetic acid (2,4-D) in Eastern Nebraska	Epidemiology. 1:349–56. doi:10.1097/00001648-199009000-00004.	JMPR USEPA	2016, Part II 2017, D444689	
FE 376	II 7	Zaranyika MF, et al.	1993	Degradation of glyphosate in the aquatic environment - an enzymatic kinetic-model that takes into account microbial-degradation of both free and colloidal (or sediment) particle adsorbed glyphosate.	J Agric Food Chem. 41(5): 838–42.	JMPR	2016, Part II	
FE 377	II 5	Zhang et al.	2007	Ultraviolet radiation exposure and risk of non-Hodgkin's lymphoma.	American Journal of Epidemiology. 165: 1255-1264.	USEPA	2017, D444689	
FE 378	II 5	Zhang, L., et al.	2019	Exposure to glyphosate-based herbicides and risk for non-Hodgkin lymphoma: a meta-analysis	Mutation Research/Reviews in Mutation Research. 781:186-206.	USEPA	2020, D455531	

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				and supporting evidence.	doi: 10.1016/j.mrrev.2019.02.001. Epub 2019 Feb 10.			
FE 379	II 5	Zouaoui, K., et al.	2013	Determination of glyphosate and AMPA in blood and urine from humans: about 13 cases of acute intoxication.	Forensic Sci Int, 226(1-3), e20-25. doi: 10.1016/j.forsciint.2012.12.010	USEPA	2014, D417808	

引用した評価書名などは下記の通りである：

（EFSA）

(1) Conclusion on the peer review of the pesticide risk assessment of the active substance glyphosate, EFSA, EFSA Journal 2015;13(11):4302
(「EFSA（2015, Conclusion）」と表記した)

(2) Peer review of the pesticide risk assessment of the potential endocrine disrupting properties of glyphosate, EFSA, EFSA Journal 2017;15(9):4979
(「EFSA（2017, PR）」と表記した)

（USEPA）

(1) Revised Glyphosate Issue Paper: Evaluation of Carcinogenic Potential, EPA's Office of Pesticide Programs December 12, 2017
DP Barcode: D444689
(「USEPA（2017, D444689)」と表記した）

(2) MEMORANDUM　Date: February 6, 2014
SUBJECT: Glyphosate: Tier II Incident Repor
DP Barcode: D417808
(「USEPA（2014, D417808)」と表記した）

(3) MEMORANDUM　Date: January 6, 2020
SUBJECT: Glyphosate: Epidemiology Review of Zhang et al. (2019) and Leon et al. (2019) publications for Response to Comments on the Proposed Interim Decision
DP Barcode: D455531
(「USEPA（2020, D455531)」と表記した）

(4) MEMORANDUM　Date: September 8, 2015

SUBJECT: Registration Review – Preliminary Ecological Risk Assessment for Glyphosate and Its Salts

DP Barcode: 417701

(「USEPA（2020, 417701）」と表記した))

(5) Glyphosate Interim Registration Review Decision Case Number 0178,

DATE: January 22, 2020

(「USEPA（2020, ID）」と表記した))

(JMPR)

Pesticide residues in food - 2016, Part Ⅱ - Toxicological evaluations

（「JMPR（2016, Part Ⅱ）」と表記した）

以上

有効成分グリホサートおよびその代謝物に関する
公表文献の収集、選択等の実施報告書
（補足資料）

検索対象期間：2010 年 1 月 1 日～2021 年 8 月

検　索　日　：2018 年 6 月 8 日
2019 年 7 月 8, 10 日
2019 年 10 月 28 日
2020 年 1 月 7 日
2020 年 2 月 24, 27 日
2020 年 5 月 4 日
2020 年 7 月 2 日
2020 年 10 月 20 日
2021 年 1 月 5 日
2021 年 5 月 14 日
2021 年 9 月 8 日

報　告　日　：2022 年 11 月 21 日

ニューファム株式会社

8. EFSA, USEPA, JMPR の評価において評価書に結果が引用されている場合は、引用した機関、引用された評価書名、発行年等の情報

表 31 EFSA, USEPA, JMPR の評価書に引用されている論文

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	評価機関	評価書情報（発行年等）	備考
FE 001	II 5	Ackermann W, et al.	2015	The influence of glyphosate on the microbiota and production of botulinum neurotoxin during ruminal fermentation.	Curr Microbiol.. 70(3):374–82	JMPR	2016, Part II	
FE 002	II 5	Acquavella JF, et al.	1999	Human ocular effects from self-reported exposure to Roundup herbicides.	Hum Exp Toxicol. 18: 479–86.	JMPR	2016, Part II	
FE 003	II 5	Acquavella JF, et al.	2004	Glyphosate biomonitoring for farmers and their families: results from the Farm Family Exposure Study.	Environ Health Perspec.112:321–6.	JMPR	2016, Part II	
FE 004	II 5	Akcha, F., et al.	2012	Genotoxicity of diuron and glyphosate in oyster spermatozoa and embryos.	Aquatic Toxicol. 106-107: 104-113.	USEPA	2015, 417701	
FE 005	II 5	Alavanja MC, et al.	2004	Pesticides and lung cancer risk in the agricultural health study cohort.	Am J Epidemiol. 160(9):876–85.	JMPR	2016, Part II	
FE 006	II 5	Alavanja MC, et al.	2014	Non-Hodgkin lymphoma risk and insecticide, fungicide and fumigant use in the agricultural health study.	PLoS ONE. 9:e109332. doi:10.1371/journal.pone.0109332	JMPR	2016, Part II	
FE 007	II 5	Alavanja, M. C., et al.	2003	Use of agricultural pesticides and prostate cancer risk in the Agricultural Health Study cohort.	Am J Epidemiol, 157(9), 800-814.	USEPA	2014, D417808	
FE 008	II 5	Alavanja, M. C., et al.	2004	Pesticides and lung cancer risk in the agricultural health study cohort.	Am J Epidemiol, 160(9), 876-885. doi: 160/9/876 [pii]10.1093/aje/kwh290	USEPA	2014, D417808	
FE 009	II 5	Alison RH, et al.	1994	Neoplastic lesions of questionable significance to humans.	Toxicol Pathol. 22;179–86.	JMPR	2016, Part II	
FE 010	II 7	Al-Rajab, Abdul Jabbar and Michael Schiavon	2010	Degradation of 14C-glyphosate and aminomethylphosphonic acid (AMPA) in three agricultural soils.	Journal of Agricultural Sciences. 22(9):1374-1380.	USEPA	2015, 417701	
FE 011	II 5	Alvarez-Moya C, et al.	2014	Comparison of the in vivo and in vitro genotoxicity of glyphosate isopropylamine salt in three different organisms.	Genetics and Molecular Biology, 37, 1, 105- 110	JMPR USEPA	2016, Part II 2017, D444689	
FE 012	II 5	Amer SM, et al.	2006	In vitro and in vivo evaluation of the genotoxicity of the herbicide glyphosate in mice.	B Natl Res Cent (Cairo). 31:427–46.	JMPR	2016, Part II	
FE 013	II 5	Amerio, P., et al.	2004	Skin toxicity from glyphosate-surfactant formulation.	J Toxicol Clin Toxicol, 42(3), 317-319.	USEPA	2014, D417808	
FE 014	II 8	Amy Blankinship	2018	Response to Public Comments on the Preliminary Ecological Risk Assessment for Glyphosate	EPA-HQ-OPP-2009-0361-2341 dated November 21, 2018	USEPA	2020 ID	
FE	II 5	Anadón A, et al	2009	Toxicokinetics of glyphosate and its metabolite	Toxicology letters, (2009 Oct 08) Vol. 190, No. 1, pp. 91-5.	JMPR	2016, Part II	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	評価機関	評価書情報（発行年等）	備考
015				aminomethyl phosphonic acid in rats.	Electronic Publication Date: 14 Jul 2009			
FE 016	II 5	Andreotti, G., et al.	2009	Agricultural pesticide use and pancreatic cancer risk in the Agricultural Health Study Cohort.	Int J Cancer, 124(10), 2495-2500. doi: 10.1002/ijc.24185	USEPA	2014, D417808 2017, D444689	
FE 017	II 5	Andreotti, G., et al.	2018	Glyphosate use and cancer incidence in the Agricultural Health Study.	JNCI: Journal of the National Cancer Institute. 110(5): 509–516. doi:10.1093/ jnci/djx233. https://academic.oup.com/jnci/article/110/5/509/4590280	USEPA	2017, D444689 2020, D455531	
FE 018	II 5	Arbuckle, T. E., et al.	2001	An exploratory analysis of the effect of pesticide exposure on the risk of spontaneous abortion in an Ontario farm population.	Environmental Health Perspectives, 109(8), 851-857.	USEPA	2014, D417808	
FE 019	II 5	Ashby J, et al.	1989	Classification according to chemical structure, mutagenicity to Salmonella and level of carcinogenicity of a further 42 chemicals tested for carcinogenicity by the U.S. National Toxicology Program.	Mutat Res. 223(2):73–103.	JMPR	2016, Part II	
FE 020	II 5	Axelrad JC, et al.	2003	The effects of acute pesticide exposure on neuroblastoma cells chronically exposed to diazinon.	Toxicology. 185:67–78.	JMPR	2016, Part II	
FE 021	II 7	Baker, N.T., et al.	2006	Occurrence and Transport of Agricultural Chemicals in Leary Weber Ditch Basin, Hancock County, Indiana, 2003- 2004. 2005 National Water Quality Assessment Program.	U.S. Department of the Interior, U.S. Geological Survey, Scientific Investigations Report, 2006	USEPA	2015, 417701	
FE 022	II 5	Baldrick P, Reeve L	2007	Carcinogenicity evaluation: comparison of tumor data from dual control groups in the CD-1 mouse.	Toxicol Pathol. 35(4):562–9.	JMPR	2016, Part II	
FE 023	II 7	Balthazor TM, Hallas LE	1986	Glyphosate-degrading microorganisms from industrial activated sludge.	Appl Environ Microbiol. 51(2):432–4.	JMPR	2016, Part II	
FE 024	II 5	Band, P. R., et al.	2011	Prostate cancer risk and exposure to pesticides in British Columbia farmers.	Prostate, 71(2), 168-183. doi: 10.1002/pros.21232	JMPR USEPA	2016, Part II 2014, D417808 2017, D444689	
FE 025	II 5	Bando, H., et al.	2010	[Extreme hyperkalemia in a patient with a new glyphosate potassium herbicide poisoning: report of a case].	Chudoku Kenkyu, 23(3), 246-249.	USEPA	2014, D417808	
FE 026	II 5	Baris, D, et al.	2001	Cohort mortality study of Philadelphia firefighters	American Journal of Industrial Medicine. 39: 463-476. doi: 10.1002/ajim.1040.	USEPA	2017, D444689	
FE 027	II 8	Barky, F. A. et al.	2012	Influence of Atrazine and Roundup Pesticides on Biochemical and Molecular Aspects of Biomphalaria alexandrina Snails.	Pesticide Biochem Physio. 104(1): 9-18	USEPA	2015, 417701	
FE	II 7	Battaglin,W.A., et	2005	GLYPHOSATE, OTHER HERBICIDES, AND	Journal of the American Water Resources Association (JAWRA),	USEPA	2015, 417701	

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028		al.		TRANSFORMATION PRODUCTS IN MIDWESTERN STREAMS, 2002	April, pp. 323-332 https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1608&context=usgsstaffpub			
FE 029	II 5	Beane Freeman LE, et al.	2005	Cancer incidence among male pesticide applicators in the Agricultural Health Study cohort exposed to diazinon.	Am J Epidemiol. 162:1070–9.	JMPR	2016, Part II	
FE 030	II 5	Benachour N, et al.	2007	Time- and dose-dependent effects of Roundup on human embryonic and placental cells.	Arch Environ Contam Toxicol. 53(1):126–33. doi:10.1007/s00244-006-0154-8.	JMPR	2016, Part II	
FE 031	II 6 / II 7	Benbrook.	2016	Trends in glyphosate herbicide use in the United States and globally.	Environmental Sciences Europe. 28(3).	USEPA	2017, D444689	
FE 032	II 5	Benjamini, Y. et al.	1995	Controlling the false discovery rate: a practical and powerful approach to multiple testing.	Journal of the Royal Statistical Society B. 57: 289-300.	USEPA	2017, D444689	
FE 033	II 8	Bernal, M. H. et al.	2009	Toxicity of Formulated Glyphosate (Glyphos) and Cosmo-Flux to Larval and Juvenile Colombian Frogs 2. Field and Laboratory Microcosm Acute Toxicity.	J. Toxicol. Environ. Health, Part A. 72(15): 966- 973	USEPA	2015, 417701	
FE 034	II 5	BfR (Bundesinstitut für Risikobewertung)	2015	Does glyphosate cause cancer?	BfR Communication No 007/2015, 23 March 2015. Available at: http://www.bfr.bund.de/cm/349/does-glyphosatecause-cancer.pdf	EFSA	2015, Conclusion	
FE 035	II 5	Blair A, et al.	2011	Impact of pesticide exposure misclassification on estimates of relative risks in the Agricultural Health Study.	Occup Environ Med. 68(7):537–41. doi:10.1136/oem.2010.059469.	JMPR	2016, Part II	
FE 036	II 5	Blakley BR	1997	Effect of roundup and tordon 202C herbicides on antibody production in mice.	Vet Hum Toxicol. 39(4):204–6.	JMPR	2016, Part II	
FE 037	II 5	Bolognesi C, et al.	1997	Genotoxic activity of glyphosate and its technical formulation roundup.	J Agric Food Chem. 45(5):1957–62.	JMPR USEPA	2016, Part II 2017, D444689	
FE 038	II 5	Bolognesi C, et al.	2009	Biomonitoring of genotoxic risk in agricultural workers from five Colombian regions: association to occupational exposure to glyphosate.	J Toxicol Environ Health A. 72(15–16):986–97.	JMPR	2016, Part II	
FE 039	II 5	Bonassi S, et al.	2001	Human MicroNucleus project: international database comparison for results with the cytokinesis-block micronucleus assay in human lymphocytes: I. Effect of laboratory protocol, scoring criteria, and host factors on the frequency of micronuclei.	Environ Mol Mutagen. 37(1):31-45.	JMPR	2016, Part II	
FE	II 5	Borenstein, M., et	2008	Introduction to Meta-Analysis.	John Wiley and Sons: London.	USEPA	2020, D455531	

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040		al.						
FE 041	II 5	Borenstein, M., et al.	2010	A basic introduction to fixed effect and random effects models for meta-analysis.	Res. Syn. Meth. 1(2):97-111. doi: 10.1002/jrsm.12. Epub 2010 Nov 21.	USEPA	2020, D455531	
FE 042	II 5	Borenstein, Michael.	2019	Common Mistakes in Meta-analysis and How to Avoid Them.	Biostat, Inc: Englewood, NJ.	USEPA	2020, D455531	
FE 043	II 8	Boutin, C., et al.	2004	Toxicity testing of fifteen non-crop plant species with six herbicides in a greenhouse experiment: implications for risk assessment.	Ecotoxicology. 13: 349-369	USEPA	2015, 417701	
FE 044	II 8	Boutin, C., et al.	2010	Measuring variability in phytotoxicity testing using crop and wild plant species.	Environ. Toxicol. Chem. 29(2): 327-337.	USEPA	2015, 417701	
FE 045	II 8	Boutin, C., et al.	2012	Phytotoxicity testing for herbicide regulation: Shortcomings in relation to biodiversity and ecosystem services in agrarian systems.	Sci. Total Environ. 415:79-92	USEPA	2015, 417701	
FE 046	II 5	Bradberry SM, et al.	2004	Glyphosate poisoning	Toxicol Rev. 23(3):159-67	JMPR USEPA	2016, Part II 2014, D417808	
FE 047	II 8	Brausch J M, et al.	2006	Pesticide usage on the southern high plains and acute toxicity of four chemicals to the fairy shrimp Thamnocephalus platyurus Crustacea: Anostraca).	Texas J Sci. 58(4):309-324.	USEPA	2015, 417701	
FE 048	II 8	Brausch JM, Beall B, Smith PN	2007	Acute and Sub-Lethal Toxicity of Three POEA Surfactant Formulations to Daphnia magna.	Bull Environ Contam Toxicol, 78, 510-514.	USEPA	2015, 417701	
FE 049	II 8	Brausch JM, Smith PN	2007	Toxicity of Three Polyethoxylated Tallowamine Surfactant Formulations to Laboratory and Field Collected Fairy Shrimp, Thamnocephalus platyurus.	Archives of Environmental Contamination and Toxicology, 52(2), 217-221.	USEPA	2015, 417701	
FE 050	II 5	Brayton et al.	2012	Pathology of aging mice and GEM background strains and experimental design.	Vet Path. 49 (1): 85-105.	USEPA	2017, D444689	
FE 051	II 5	Brewster DW, et al.	1991	Metabolism of glyphosate in Sprague–Dawley rats: Tissue distribution, identification, and quantitation of glyphosate-derived materials following a single oral dose.	Fundam Appl Toxicol. 17(1):43–51.	JMPR	2016, Part II	
FE 052	II 8	Bringolf RB, et al.	2007	Acute and Chronic Toxicity of Glyphosate Compounds to Glochidia and Juveniles of Lampsilis siliquoidea (Unionidae).	Environ Toxicol Chem. 26(10):2094-100	USEPA	2015, 417701	
FE 053	II 5	Brown LM, et al.	1990	Pesticide exposures and other agricultural risk factors for leukemia among men in Iowa and Minnesota.	Cancer Res, 50(20), 6585-6591.	JMPR USEPA	2016, Part II 2014, D417808 2017, D444689	

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FE 054	II 5	Brown, L. M., et al.	1993	Pesticide exposures and multiple myeloma in Iowa men.	Cancer Causes Control, 4(2), 153-156.	USEPA	2014, D417808 2017, D444689	
FE 055	II 5	Cantor KP, et al.	1992	Pesticides and other agricultural risk factors for non-Hodgkin's lymphoma among men in Iowa and Minnesota.	Cancer Res, 52(9), 2447-2455.	JMPR USEPA	2016, Part II 2014, D417808	
FE 056	II 5	Cantor, K.P., et al.	1993	Pesticides and Other Agricultural Risk Factors for Non-Hodgkin's Lymphoma among Men in Iowa and Minnesota.	Cancer Research 53, 2421-2421.	USEPA	2017, D444689	
FE 057	II 5	Carreon, T., et al.	2005	Gliomas and farm pesticide exposure in women: The Upper Midwest Health Study.	Environmental Health Perspectives, 113(5), 546-551. doi: 10.1289/ehp.7456	USEPA	2014, D417808 2017, D444689	
FE 058	II 6 / II 7 / II 8	Casabe, N. et al.	2007	Ecotoxicological Assessment of the Effects of Glyphosate and Chlorpyrifos in an Argentine Soya Field.	Argentine Soya Field. 7 (4): 232-239	USEPA	2015, 417701	
FE 059	II 6 / II 7 / II 8	Cerdeira A, Duke S	2006	The current status and environmental impacts of glyphosate-resistant crops: a review.	J Environ Qual. 35(5):1633–58.	JMPR	2016, Part II	
FE 060	II 5	Chan PO, Mahler JF	1992	NTP technical report on toxicity studies of glyphosate (CAS No. 1071-83-6) administered in dosed feed to F344/N rats and B6C3F1 mice.	National Toxicology Program, Research Triangle Park, NC, USA. NTP Toxicity Report Series No. 16, NIH Publication 92-3135, dated July 1992. Submitted to WHO by Monsanto Int. Services SA, Brussels, Belgium.	JMPR	2016, Part II	
FE 061	II 5	Chandra M, et al.	1992	Spontaneous neoplasms in aged Sprague-Dawley rats.	Arch Toxicol. 66:496–502.	JMPR	2016, Part II	
FE 062	II 5	Chandra M, Frith CH	1994	Spontaneous renal lesions in CD-1 and B6C3F1 mice.	Exp Toxicol Pathol. 46:189–98	JMPR	2016, Part II	
FE 063	II 5	Chang, C. B., & Chang, C. C.	2009	Refractory cardiopulmonary failure after glyphosate surfactant intoxication: a case report.	J Occup Med Toxicol, 4, 2. doi: 10.1186/1745- 6673-4-2	USEPA	2014, D417808	
FE 064	II 5	Chang, C. Y., et al.	1999	Clinical impact of upper gastrointestinal tract injuries in glyphosate-surfactant oral intoxication.	Hum Exp Toxicol, 18(8), 475-478.	USEPA	2014, D417808	
FE 065	II 5	Chang, E.T., et al.	2016	Systematic review and meta-analysis of glyphosate exposure and risk of lymphohematopoietic cancers.	Journal of environmental science and health Part B, Pesticides, food contaminants, and agricultural wastes 51, 402-434.	USEPA	2017, D444689	
FE 066	II 8	Chen L, et al.	2012	The combined effects of UV-B radiation and herbicides on photosynthesis, antioxidant enzymes and DNA damage in two bloom-forming cyanobacteria.	Ecotoxicol Environ Saf. 80:224–30.	JMPR	2016, Part II	
FE 067	II 5	Chen, H. H., et al.	2013	Spectrum of corrosive esophageal injury after intentional paraquat or glyphosatesurfactant	Int J Gen Med, 6, 677-683. doi: 10.2147/ijgm.s48273	USEPA	2014, D417808	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載誌名、号、ページ等	評価機関	評価書情報（発行年等）	備考
				herbicide ingestion.				
FE 068	II 5	Chen, Y. J., et al.	2009	The epidemiology of glyphosatesurfactant herbicide poisoning in Taiwan, 1986-2007: a poison center study.	Clin Toxicol (Phila), 47(7), 670-677. doi: 10.1080/15563650903140399	USEPA	2014, D417808	
FE 069	II 5	Chester G, et al.	1986	Biological monitoring of a herbicide applied through backpack and vehicle sprayers.	Toxicol Lett. 33:137–49.	JMPR	2016, Part II	
FE 070	II 5	Chhabra et al	1990	An over view of prechronic and chronic toxicity/carcinogenicity experimental study designs and criteria used by the National Toxicology Program.	Environ Health Perspect. 86: 313-321.	USEPA	2017, D444689	
FE 071	II 5	Chirn-Bin Chang, Chia-Chu Chang	2009	Refractory cardiopulmonary failure after glyphosate surfactant intoxication: a case report.	J Occup Med Toxicol. 2009 Jan 30;4:2.	USEPA	2014, D417808	
FE 072	II 5	Chruscielska K, et al.	2000a	Glyphosate - Evaluation of chronic activity and possible far-reaching effects. Part 1. Studies on chronic toxicity.	Pestycydy (Warsaw). 3–4: 11–20.	JMPR USEPA	2016, Part II 2017, D444689	
FE 073	II 5	Chruscielska K, et al.	2000b	Glyphosate: Evaluation of chronic activity and possible far-reaching effects. Part 2. Studies on mutagenic activity.	Pestycydy (Warsaw). 3–4: 21–25.	JMPR USEPA	2016, Part II 2017, D444689	
FE 074	II 5	Cimino, M.C.	2006	Comparative overview of current international strategies and guidelines for genetic toxicology testing for regulatory purposes.	Environmental and Molecular Mutagenesis 47 (9): 362-390.	USEPA	2017, D444689	
FE 075	II 6	Clair E, et al.	2012	Effects of Roundup and glyphosate on three food microorganisms: Geotrichum candidum, Lactococcus lactis subsp. cremoris and Lactobacillus delbrueckii subsp. bulgaricus.	Curr Microbiol. 64:486–91.	JMPR	2016, Part II	
FE 076	II 6 / II 7 / II 8	Claire Paisley-Jones	2020	Glyphosate Case (103601,103604, 103605, 103607, 103608, 103613, 417300) National and State Summary Use and Usage Matrix	EPA-HQ-OPP-2020-0585-0003. MEMORANDUM	USEPA	2020 ID	
FE 077	II 5	Clegg ED, et al.	1997	Leydig cell hyperplasia and adenoma formation: Mechanisms and relevance to humans.	Reprod Toxicol. 11;107–21.	JMPR	2016, Part II	
FE 078	II 5	Clewell HJ, et al.	2005	Quantitative estimates of risk for noncancer endpoints.	Risk Anal. 25:285–9.	JMPR	2016, Part II	
FE 079	II 5 / II 6	Coble J, et al.	2005	The validation of a pesticide exposure algorithm using biological monitoring results.	J Occup Environ Hyg. 2:194–201.	JMPR	2016, Part II	
FE 080	II 5	Coble J, et al.	2011	An updated algorithm for estimation of pesticide exposure intensity in the Agricultural Health Study.	Int J Environ Res Public Health. 8(12):4608–22.	JMPR	2016, Part II	

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FE 081	II 5	Cocco, P., et al.	2013	Lymphoma risk and occupational exposure to pesticides: results of the Epilymph study	Occupational and environmental medicine 70, 91-98.	USEPA	2017, D444689	
FE 082	II 8	Coler, R. A. et al.	2005	Applying Weight Gain in Pomacea lineata (Spix 1824) (Mollusca: Prosobranchia) as a Measure of Herbicide Toxicity.	Braz. J. Biol. 65(4): 617-623	USEPA	2015, 417701	
FE 083	II 5	Collins, A.R., et al.	2008	The Comet assay: topical issues.	Mutagenesis 23 (3): 143-151.	USEPA	2017, D444689	
FE 084	II 8	Contardo-Jara, V. et al.	2009	Bioaccumulation of Glyphosate and Its Formulation Roundup Ultra in Lumbriculus variegatus and Its Effects on Biotransformation and Antioxidant Enzymes.	Environ. Poll. 157(1): 57-63	USEPA	2015, 417701	
FE 085	II 5	Cooke et al.	2003	Oxidative DNA damage: mechanisms, mutation, and disease.	FASEB J. 17 (10): 1195-214.	USEPA	2017, D444689	
FE 086	II 7	Coupe, R.H., et al.	2011	Fate and transport of glyphosate and aminomethylphosphonic acid in surface water of agricultural basins.	Pest Manag Sci, 68:16-30.	USEPA	2015, 417701	
FE 087	II 8	Cuhra, M. et al.	2013	Clone- and Age-Dependent Toxicity of a Glyphosate Commercial Formulation and Its Active Ingredient in Daphnia magna.	Ecotoxicol. 22:251-262	USEPA	2015, 417701	
FE 088	II 5	Curtis, K., et al.	1999	The effect of pesticide exposure on time to pregnancy.	Epidemiology, 10(2), 112-117. doi: 10.1097/00001648-199903000-00005	USEPA	2014, D417808	
FE 089	II 5 / II 6 / II 7/ II 8	Dana L. Friedman	2020	Response from the Pesticide Re-evaluation Division to Comments on the Glyphosate Proposed Interim Decision	EPA-HQ-OPP-2009-0361 MEMORANDUM dated January 16, 2020	USEPA	2020 ID	
FE 090	II 5	Dayton, S. B., et al.	2010	Pesticide use and myocardial infarction incidence among farm women in the agricultural health study.	J Occup Environ Med, 52(7), 693-697. doi:10.1097/JOM.0b013e3181e66d25	USEPA	2014, D417808	
FE 091	II 8	De Freitas Bueno, A. et al.	2008	Effects of Pesticides Used in Soybean Crops to the Egg Parasitoid Trichogramma pretiosum.	Ciencia Rural. 38, (6): 1495-1503	USEPA	2015, 417701	
FE 092	II 5	De Roos AJ, et al.	2003	Integrative assessment of multiple pesticides as risk factors for non-Hodgkin's lymphoma among men.	Occupational and environmental medicine 60(9): 1-9. doi: 10.1136/oem.60.9.e11.	JMPR USEPA	2016, Part II 2014, D417808 2017, D444689 2020, D455531	
FE 093	II 5	De Roos AJ, et al.	2005	Cancer incidence among glyphosate-exposed pesticide applicators in the Agricultural Health Study.	Environ Health Perspect, 113(1), 49-54.	JMPR USEPA	2016, Part II 2014, D417808 2017, D444689 2020, D455531	

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FE 094	II 5	De Roos, A. J., Cooper, G. S., et al.	2005	Rheumatoid arthritis among women in the Agricultural Health Study: risk associated with farming activities and exposures.	Ann Epidemiol, 15(10), 762-770. doi: 10.1016/j.annepidem.2005.08.001	USEPA	2014, D417808	
FE 095	II 5	Defarge N, et al.	2016	Co-formulants in glyphosate-based herbicides disrupt aromatase activity in human cells below toxic levels.	Int J Environ Res Public Health. 13(3): 264. doi.org/10.3390/ijerph13030264.	JMPR USEPA	2016, Part II 2017, D444689	
FE 096	II 5	Dennis, L. K., et al.	2010	Pesticide use and cutaneous melanoma in pesticide applicators in the agricultural heath study.	Environ Health Perspect, 118(6), 812-817. doi: 10.1289/ehp.0901518	USEPA	2014, D417808 2017, D444689	
FE 097	II 5 / II 6 / II 7/ II 8	Diamond, G., & Durkin, P.	2011	Glyphosate Human Health and Ecological Risk Assessment Final Report (USDA).	USDA	USEPA	2014, D417808	
FE 098	II 5 / II 8	Dimitrov BD, et al.	2006	Comparative genotoxicity of the herbicides Roundup, Stomp and Reglone in plant and mammalian test systems.	Mutagenesis. 21(6):375–82	JMPR USEPA	2016, Part II 2017, D444689	
FE 099	II 5	Dosemeci M, et al.	2002	A quantitative approach for estimating exposure to pesticides in the Agricultural Health Study.	Ann Occup Hyg. 46:245–60.	JMPR	2016, Part II	
FE 100	II 8	Dosnon-Olette, R. et al.	2011	Potential Use of Lemna minor for the Phytoremediation of Isoproturon and Glyphosate.	Internat J Phytoremed. 13(6): 601-612	USEPA	2015, 417701	
FE 101	II 5	Dourson M, et al.	2014	Mode of action analysis for liver tumors from oral 1,4-dioxane exposures and evidence-based dose response assessment.	Regul Toxicol Pharmacol. 68(3):387-401. doi: 10.1016/j.yrtph.2014.01.011	JMPR	2016, Part II	
FE 102	II 5 / II 6 / II 7/ II 8	ECHA（European Chemicals Agency）	2017	Committee for Risk Assessment (RAC) Opinion proposing harmonised classification and labelling at EU level of glyphosate (ISO); N-(phosphonomethyl)glycine.	CLH-O-0000001412- 86-149/F. Adopted 15 March 2017. Available online: www.echa.europa.eu	EFSA	2017, PR	
FE 103	II 6 / II 7	EFSA	2007	Scientific Opinion of the Panel on Plant Protection Products and their Residues on a request from EFSA related to the default Q10 value used to describe the temperature effect on transformation rates of pesticides in soil.	The EFSA Journal 2007, 622, 1–32. doi:10.2903/j.efsa.2008.622	EFSA	2015, Conclusion	
FE 104	II 5 / II 6 / II 7/ II 8	EFSA	2015a	Peer Review Report to the conclusion regarding the peer review of the pesticide risk assessment of the active substance glyphosate.	Available at www.efsa.europa.eu	EFSA	2015, Conclusion	
FE 105	II 5 / II 6 / II 7/ II 8	EFSA	2015b	Statement of EFSA on the request for the evaluation of the toxicological assessment of the co-formulant POE-tallowamine.	Available at www.efsa.europa.eu	EFSA	2015, Conclusion	
FE	II 5 / II 6 / II	EFSA（European	2015	Conclusion on the peer review of the pesticide	EFSA Journal 2015;13(11):4302, 107 pp.	EFSA	2017, PR	

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FE 107	II 5	EFSA (European Food Safety Authority)	2017	Peer review report to the conclusion regarding the peer review of the pesticide risk assessment of the potential endocrine disrupting properties of glyphosate.	Available online: www.efsa.europa.eu	EFSA	2017, PR	
FE 108	II 7	EFSA PPR Panel	2013	Scientific Opinion on the report of the FOCUS groundwater working group (FOCUS, 2009): assessment of lower tiers.	EFSA Journal 2013;11(2):3114. 29 pp. doi:10.2903/j.efsa.2013.3114	EFSA	2015, Conclusion	
FE 109	II 5	EFSA Scientific Committee	2013	Scientific Opinion on the hazard assessment of endocrine disruptors: scientific criteria for identification of endocrine disruptors and appropriateness of existing test methods for assessing effects mediated by these substances on human health and the environment.	EFSA Journal 2013;11(3):3132. 84 pp. doi:10.2903/j.efsa.2013.3132	EFSA	2015, Conclusion 2017, PR	
FE 110	II 8	Egan, J.F., et al.	2014	Acomparison of the herbicide tolerances of rare and common plants in an agricultural landscape.	Environ. Toxicol. Chem. 33(3). Doi: 10.1002/ext.2491	USEPA	2015, 417701	
FE 111	II 5	Engel, L. S., et al.	2005	Pesticide use and breast cancer risk among farmers' wives in the agricultural health study.	Am J Epidemiol, 161(2), 121-135. doi: 161/2/121 [pii]10.1093/aje/kwi022	USEPA	2014, D417808 2017, D444689	
FE 112	II 5	Eriksson M, et al.	2008	Pesticide exposure as risk factor for non-Hodgkin lymphoma including histopathological subgroup analysis.	International Journal of Cancer, 123(7), 1657-1663. doi: 10.1002/ijc.23589	JMPR USEPA	2016, Part II 2014, D417808 2017, D444689 2020, D455531	
FE 113	II 5	Escande A, et al.	2006	Evaluation of ligand selectivity using reporter cell lines stably expressing estrogen receptor alpha or beta.	Biochem Pharmacol. 71:1459–69.	JMPR	2016, Part II	
FE 114	II 5	Eskenazi B, et al.	2004	Association of in utero organophosphate pesticide exposure and fetal growth and length of gestation in an agricultural population.	Environ Health Perspect. 112: 1116–24.	JMPR	2016, Part II	
FE 115	II 5	Evans N, et al.	2012	Validation of T47D-KBluc cell assay for detection of estrogen receptor agonists and antagonists.	Society of Toxicology (SOT) Annual Meeting, San Francisco, CA, USA. 11–15 March 2012	JMPR	2016, Part II	
FE 116	II 5	Fisher, K. R., et al.	2008	Pesticide-associated pemphigus vulgaris.	Cutis, 82(1), 51-54.	USEPA	2014, D417808	
FE 117	II 5	Flower, K. B., et al.	2004	Cancer risk and parental pesticide application in children of agricultural health study participants.	Environmental Health Perspectives, 112(5), 631-635.	USEPA	2014, D417808 2017, D444689	
FE 118	II 7	FOCUS	2001	FOCUS Surface Water Scenarios in the EU Evaluation Process under 91/414/EEC.	Report of the FOCUS Working Group on Surface Water Scenarios, EC Document Reference SANCO/4802/2001-rev.2.	EFSA	2015, Conclusion	

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FE 119	II 7	FOCUS	2009	Assessing Potential for Movement of Active Substances and their Metabolites to Ground Water in the EU.	Report of the FOCUS Workgroup, EC Document Reference SANCO/13144/2010-version.1. 604 pp, as outlined in Generic Guidance for Tier 1 FOCUS groundwater Assessment, version 2.0 dated January 2011.	EFSA	2015, Conclusion	
FE 120	II 5	Fontana et al	1990	Incidence rates of lymphomas and environmental measurements of phenoxy herbicides: ecological analysis and case-control study.	Archives of Environmental Health: An International Journal. 53: 384-387.	USEPA	2017, D444689	
FE 121	II 5	Forgacs AL, et al.	2012	BLTK1 murine Leydig cells: a novel steroidogenic model for evaluating the effects of reproductive and developmental toxicants.	Toxicol Sci. 127(2):391–402. doi:10.1093/toxsci/kfs121.	JMPR USEPA	2016, Part II 2017, D444689	
FE 122	II 5	Franklin CA, et al.	1986	The use of biological monitoring in the estimation of exposure during the application of pesticides.	Toxicol Lett. 33:127–36.	JMPR	2016, Part II	
FE 123	II 5 / II 6 / II 7/ II 8	Franz JI, et al.	1997	Glyphosate: a unique global herbicide.	ACS Monograph Series no. 189. Washington (DC): American Chemical Society. 1–678.	JMPR	2016, Part II	
FE 124	II 5	Garcia, A., et al.	1998	Paternal exposure to pesticides and congenital malformations.	Scandinavian Journal of Work Environment & Health, 24(6), 473-480.	USEPA	2014, D417808	
FE 125	II 5	Garry, V. F., et al.	2002	Birth defects, season of conception, and sex of children born to pesticide Page 47 of 127 applicators living in the Red River Valley of Minnesota, USA.	Environ Health Perspect, 110 Suppl 3, 441-449.	USEPA	2014, D417808	
FE 126	II 5	Gasnier C, et al.	2009	Glyphosate-based herbicides are toxic and endocrine disruptors in human cell lines.	Toxicology. 262:184–91. doi:10.1016/j. tox.2009.06.006.	JMPR	2016, Part II	
FE 127	II 5	George J, et al.	2010	Studies on glyphosate-induced carcinogenicity in mouse skin: A proteomic approach.	J Proteomics 73(5): 951-964.	JMPR USEPA	2016, Part II 2017, D444689	
FE 128	II 5 / II 6 / II 7/ II 8	Germany	1998	Draft assessment report (DAR) on the active substance glyphosate prepared by the rapporteur Member State Germany in the framework of Directive No 91/414/EEC		EFSA	2015, Conclusion	
FE 129	II 5 / II 6 / II 7/ II 8	Germany	2013	Renewal assessment report (RAR) on the active substance glyphosate prepared by the rapporteur Member State Germany in the framework of Regulation (EU) No 1141/2010	Available at www.efsa.europa.eu	EFSA	2015, Conclusion	
FE 130	II 5 / II 6 / II 7/ II 8	Germany	2015	Final addendum to the renewal assessment report (RAR) on the active substance glyphosate prepared by the rapporteur Member State	Available online: www.efsa.europa.eu	EFSA	2017, PR	

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FE 131	II 5 / II 6 / II 7/ II 8	Germany	2015	Final Addendum to the renewal assessment report on glyphosate, compiled by EFSA, October 2015.	Available at www.efsa.europa.eu	EFSA	2015, Conclusion	
FE 132	II 5	Germany	2017a	Addendum 2 to the renewal assessment report (RAR): Assessment of potential endocrine disrupting properties of glyphosate. 30 March 2017.	Available online: www.efsa.europa.eu	EFSA	2017, PR	
FE 133	II 5	Germany	2017b	Addendum 2 to the renewal assessment report (RAR): Assessment of potential endocrine disrupting properties of glyphosate. Revised on 22 May 2017 (rev 1) and 4 July 2017 (rev 2).	Available online: www.efsa.europa.eu	EFSA	2017, PR	
FE 134	II 5	Ghisi, N.d.C., et al.	2016	Does exposure to glyphosate lead to an increase in the micronuclei frequency? A systematic and meta-analytic review.	Chemosphere 145, 42-54.	USEPA	2017, D444689	
FE 135	II 5	Giknis, M. L. A., et al.	2005	Spontaneous Neoplastic Lesions in the Crl:CD1 (ICR) Mouse in Control Groups from 18 Month to 2 Year Studies.	Charles River. http://www.criver.com/files/pdfs/rms/cd1/rm_rm_r_lesions_crlcd_1_icr_mouse.aspx	USEPA	2017, D444689	
FE 136	II 5	Goldner, W. S., et al.	2010	Pesticide use and thyroid disease among women in the Agricultural Health Study.	Am J Epidemiol, 171(4), 455-464. doi: kwp404 [pii]10.1093/aje/kwp404	USEPA	2014, D417808	
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FE 138	II 5	Greim, H., et al.	2015	Evaluation of carcinogenic potential of the herbicide glyphosate, drawing on tumor incidence data from fourteen chronic/carcinogenicity rodent studies.	Crit Rev Toxicol 45(3): 185-208.	USEPA	2017, D444689	
FE 139	II 5 / II 8	Grisolia CK	2002	A comparison between mouse and fish micronucleus test using cyclophosphamide, mitomycin C and various pesticides.	Mutat Res. 518(2):145–50.	JMPR	2016, Part II	
FE 140	II 8	Guilherme S, et al.	2012	DNA damage in fish (*Anguilla anguilla*) exposed to a glyphosate-based herbicide – elucidation of organ-specificity and the role of oxidative stress.	Mutat Res. 743(1-2):1–9	JMPR	2016, Part II	
FE 141	II 5	Guyatt GH, et al.	2008	GRADE: an emerging consensus on rating quality of evidence and strength of recommendations.	BMJ. 336:924–6.	JMPR	2016, Part II	
FE	II 5	Guyton, KZ, et al.	2015	Carcinogenicity of tetrachlorvinphos, parathion,	Lancet Oncology, 2015. Published online March 20, 2015.	EFSA	2015,	

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FE 145	II 6 / II 8	Hartzler. R.G.	2010	Reduction in Common Milkweed (*Asclepias Sytiaca*) Occurrence in Iowa Cropland from 1999 to 2009, 29	Crop Protection 1542, 1542.	USEPA	2015, 417701	
FE 146	II 5	Haseman, JK.	1995	Data analysis: Statistical analysis and use of historical control data.	Regul Toxicol Pharmacol 21:52–59.	USEPA	2017, D444689	
FE 147	II 5	Hecker M,	2011	The OECD validation program of the H295R steroidogenesis assay: phase 3. Final inter-laboratory validation study.	Environ Sci Pollut Res. 18:503–15.	JMPR	2016, Part II	
FE 148	II 5	Heras-Mendaza, F., et al.	2008	Erythema multiforme-like eruption due to an irritant contact dermatitis from a glyphosate pesticide.	Contact Dermatitis, 59(1), 54-56. doi: 10.1111/j.1600-0536.2007.01307.x	USEPA	2014, D417808	
FE 149	II 5	Heydens WF, et al.	2008	Genotoxic potential of glyphosate formulations: Mode-of-action investigations.	J Agric Food Chem. 56(4):1517–23.	JMPR USEPA	2016, Part II 2017, D444689	
FE 150	II 5	Higgins JP, Green S (editors)	2011	Cochrane handbook for systematic reviews of interventions version 5.1.0. The Cochrane Collaboration, 2011.	(www.cochrane-handbook.org. http://handbook.cochrane.org/chapter_10/10_4_3_1_recom mendations_on_testing_for_funnel_plot_asymm etry.htm, accessed May 2016)	JMPR	2016, Part II	
FE 151	II 5 / II 6 / II 7/ II 8	Hill AB	1965	The Environment and Disease: Association or Causation?	Proc R Soc Med. May 1965; 58(5): 295–300.	USEPA	2017, D444689	
FE 152	II 5	Hines CJ, et al.	2008	Captan exposure and evaluation of a pesticide exposure algorithm among orchard pesticide applicators in the Agricultural Health Study.	Ann Occup Hyg. 52:153–66. doi:10.1093/annhyg/men001.	JMPR	2016, Part II	
FE 153	II 5	Hoar SK, et al.	1986	Agricultural herbicide use and risk of lymphoma and soft-tissue sarcoma.	JAMA. 256(9):1141–7. doi:10.1001/jama.1986.03380090081023.	JMPR USEPA	2016, Part II 2017, D444689	
FE 154	II 5	Hohenadel, K., et al.	2011	Exposure to multiple pesticides and risk of non-Hodgkin lymphoma in men from six Canadian provinces.	Int J Environ Res Public Health, 8(6), 2320-2330. doi: 10.3390/ijerph8062320	USEPA	2014, D417808 2017, D444689	
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FE 157	II 5	Hoppin, J. A., et al.	2007	Pesticide use and chronic bronchitis among farmers in the agricultural health study.	American Journal of Industrial Medicine, 50(12), 969-979. doi:10.1002/ajim.20523	USEPA	2014, D417808	
FE 158	II 5	Hoppin, J. A., et al.	2008	Pesticides and atopic and nonatopic asthma among farm women in the agricultural health study.	American Journal of Respiratory and Critical Care Medicine, 177(1), 11-18.	USEPA	2014, D417808	
FE 159	II 5	Hoppin, J. A., et al.	2009	Pesticide use and adult-onset asthma among male farmers in the Agricultural Health Study.	European Respiratory Journal, 34(6), 1296-1303. doi:10.1183/09031936.00005509	USEPA	2014, D417808	
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FE 161	II 5	Hour, B. T., et al.	2012	Herbicide roundup intoxication: successful treatment with continuous renal replacement therapy.	Am J Med (Vol. 125, pp. e1-2). United States.	USEPA	2014, D417808 2017, D444689	
FE 162	II 8	Howe CM, et al.	2004	Toxicity of glyphosate-based pesticides to four North American frog species.	Environ Toxicol Chem. 23(8):1928–38.	JMPR	2016, Part II	
FE 163	II 5	Hsu and Stedeford	2010	Cancer Risk Assessment: Chemical Carcinogenesis, Hazard Evaluation, and Risk Quantification.	John Wiley & Sons.	USEPA	2017, D444689	
FE 164	II 5	IARC	2015	Monographs, Volume 112: Some organophosphate insecticides and herbicides: tetrachlorvinphos, parathion, malathion, diazinon and glyphosate.	IARC Working Group. Lyon; 3–10 March 2015. IARC Monogr Eval Carcinog Risk Chem Hum.	EFSA	2015, Conclusion	
FE 165	II 5	International Agency for Research on Cancer (IARC)	1987	1,4-Dioxane.	In: IARC monographs on the evaluation of carcinogenic risks to humans. Volume 71 Supplement 7. Overall evaluations of carcinogenicity: An updating of IARC monographs, Volumes 1 to 42. Lyon: International Agency for Research on Cancer. pp. 201. (http://monographs.iarc.fr/ENG/Monographs/suppl7/Suppl7.pdf; accessed 8 November 2016)	JMPR	2016, Part II	
FE 166	II 5	International Agency for Research on	2015	Volume 112: Some organophosphate insecticides and herbicides: tetrachlorvinphos, parathion, malathion, diazinon and glyphosate. IARC	IARC Monogr Eval Carcinog Risk Chem Hum; 3–10 March 2015.	JMPR	2016, Part II	

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FE 167	II 8	James Hetrick	2015	Registration Review - Preliminary Ecological Risk Assessment for Glyphosate and Its Salts(PC Codes: 417300, 103601, 103604, 103607, 103608, 103613, 103603, 103605, 128501; DP Barcode: 417701)	EPA-HQ-OPP-2009-0361-0077. MEMORANDUM DP Barcode: D417701 dated September 8, 2015	USEPA	2020 ID	
FE 168	II 5	Jauhiainen A, et al.	1991	Occupational exposure of forest workers to glyphosate during brush saw spraying work.	Am Ind Hyg Assoc J. 52:61–4.	JMPR	2016, Part II	
FE 169	II 5	Jiunn-Yih Wu, et al.	2006	Parenteral glyphosate-surfactant herbicide intoxication	Am J Emerg Med. 2006 Jul;24(4):504-6.	USEPA	2014, D417808	
FE 170	II 5 / II 6 / II 7/ II 8	JMPR	2004	Report of the Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group on Pesticide Residues Rome, Italy, 20–29 September 2004	Report 2004, 383 pp.	EFSA	2015, Conclusion	
FE 171	II 5 / II 6 / II 7/ II 8	JMPR	2007	Report of the Joint Meeting of the FAO Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group on Pesticide Residues Geneva, Switzerland, 18–27 September 2007	Report 2007, 164 pp.	EFSA	2015, Conclusion	
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FE 371	II 8	Xie L,et al.	2005	Evaluation of estrogenic activities of aquatic herbicides and surfactants using an rainbow trout vitellogenin assay.	Toxicol Sci. 87(2):391–8. doi:10.1093/toxsci/kfi249.	JMPR	2016, Part II	
FE 372	II 5	Yauk et al.,	2015	Approaches to identifying germ cell mutagens: Report of the 2013 IWGT workshop on germ cell assays.	Mutat Res Genet Toxicol Environ Mutagen, 783: 36-54.	USEPA	2017, D444689	
FE 373	II 5	Yiin, J. H., et al.	2012	The Upper Midwest Health Study: a case-control study of pesticide applicators and risk of glioma.	Environ Health, 11, 39. doi: 10.1186/1476-069X-11-39	USEPA	2014, D417808 2017, D444689	
FE 374	II 5	Yoo, S., & BS., K.	2010	Glyphosate Induced Severe Tublulo-Interstitial Nephritis Requiring Hemodialysis.	The Korean Journal of Nephrology, 158-161.	USEPA	2014, D417808	
FE 375	II 5	Zahm SH, et al.	1990	A case-control study of non-Hodgkin's lymphoma and the herbicide 2,4- dichlorophenoxyacetic acid (2,4-D) in Eastern Nebraska	Epidemiology. 1:349–56. doi:10.1097/00001648-199009000-00004.	JMPR USEPA	2016, Part II 2017, D444689	
FE 376	II 7	Zaranyika MF, et al.	1993	Degradation of glyphosate in the aquatic environment - an enzymatic kinetic-model that takes into account microbial-degradation of both free and colloidal (or sediment) particle adsorbed glyphosate.	J Agric Food Chem. 41(5): 838–42.	JMPR	2016, Part II	
FE 377	II 5	Zhang et al.	2007	Ultraviolet radiation exposure and risk of non-Hodgkin's lymphoma.	American Journal of Epidemiology. 165: 1255-1264.	USEPA	2017, D444689	
FE 378	II 5	Zhang, L., et al.	2019	Exposure to glyphosate-based herbicides and risk for non-Hodgkin lymphoma: a meta-analysis	Mutation Research/Reviews in Mutation Research. 781:186-206.	USEPA	2020, D455531	

ID	データ要求（項目番号）	著者	出版年	論文表題	掲載詩名、号、ページ等	評価機関	評価書情報（発行年等）	備考
				and supporting evidence.	doi: 10.1016/j.mrrev.2019.02.001. Epub 2019 Feb 10.			
FE 379	II 5	Zouaoui, K., et al.	2013	Determination of glyphosate and AMPA in blood and urine from humans: about 13 cases of acute intoxication.	Forensic Sci Int, 226(1-3), e20-25. doi: 10.1016/j.forsciint.2012.12.010	USEPA	2014, D417808	

引用した評価書名などは下記の通りである：

（EFSA）

(1) Conclusion on the peer review of the pesticide risk assessment of the active substance glyphosate, EFSA, EFSA Journal 2015;13(11):4302
(「EFSA（2015, Conclusion）」と表記した)

(2) Peer review of the pesticide risk assessment of the potential endocrine disrupting properties of glyphosate, EFSA, EFSA Journal 2017;15(9):4979
(「EFSA（2017, PR）」と表記した)

（USEPA）

(1) Revised Glyphosate Issue Paper: Evaluation of Carcinogenic Potential, EPA's Office of Pesticide Programs December 12, 2017
DP Barcode: D444689
(「USEPA（2017, D444689)」と表記した）

(2) MEMORANDUM　Date: February 6, 2014
SUBJECT: Glyphosate: Tier II Incident Repor
DP Barcode: D417808
(「USEPA（2014, D417808)」と表記した）

(3) MEMORANDUM　Date: January 6, 2020
SUBJECT: Glyphosate: Epidemiology Review of Zhang et al. (2019) and Leon et al. (2019) publications for Response to Comments on the Proposed Interim Decision
DP Barcode: D455531
(「USEPA（2020, D455531)」と表記した）

(4) MEMORANDUM　Date: September 8, 2015

SUBJECT: Registration Review – Preliminary Ecological Risk Assessment for Glyphosate and Its Salts
DP Barcode: 417701
(「USEPA（2020, 417701）」と表記した))

(5) Glyphosate Interim Registration Review Decision Case Number 0178,
DATE: January 22, 2020
(「USEPA（2020, ID）」と表記した))

(JMPR)

Pesticide residues in food - 2016, Part Ⅱ - Toxicological evaluations
（「JMPR（2016, Part Ⅱ)」と表記した）

以上

Literature Review Report

Scientific full text assessment of peer-reviewed open literature covering the publication period of 2006 to 2009 the active substance glyphosate (CAS RN® 1071-83-6) for renewal in Japan.

as under Article 8(5) of Regulation (EC) No 1107/2009

(Ref. EFSA Journal 2011; 9(2) 2092)

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01.07.2006 – 31.12.2009

Content

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1 Summary

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

This Literature Review Report summarizes the full text assessment glyphosate public literature, covering the publication period 1st July 2006 to 31st December 2009. As requested by the notification No.3-Shouan-3460, issued on October 1, 2021 by Director-General, Food Safety and Consumer Affairs Bureau, Ministry of Agriculture, Forestry and Fisheries, subject "Submission of Published Literature for Reevaluations".

The literature search was conducted accessing 11 bibliographic databases via the service provider STN.

3294 articles in total were identified upon removal of duplicates within the current search (1st July 2006 to 31st December 2009).
All 3294 articles were subsequently assessed for their relevance at title/abstract level ("rapid assessment" according to the procedure and requirements stated in the EFSA 2092 Guidance Document).

A total of 3050 of the 3294 articles were identified as "non-relevant" in the rapid assessment (e.g. publications dealing with chemical synthesis, efficacy, analytical methods or publications which are not related to glyphosate or its metabolites) and excluded from further evaluation.

For the remaining 244 articles, identified as potentially "relevant" or of "unclear relevance" in the rapid assessment, the full-text documents[5] were reviewed in detail ("detailed assessment").

A total of 166 articles of the remaining 244 articles were identified as "non-relevant" in the detailed assessment and were excluded from further evaluation. The list of the articles and the justification for their non-relevance is provided in **Table 29** of this Literature Review Report document.

The remaining 78 articles identified as "relevant" in the detailed assessment were classified according to the EFSA 2092 Guidance Document (EFSA Journal 2011;9(2):2092, Point 5.4.1).

Category A — Articles which provide data for establishing or refining risk assessment parameters.
For all articles of Category A, a reliability assessment was performed as recommended in the EFSA 2092 Guidance Document (GD). Summaries were compiled for Category A articles classified as "reliable" or "reliable with restrictions". The list of these Category A & reliable / reliable with restrictions articles can be found in **Table 23** and **Table** 24**24** of this Literature Review Report document.

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[1] (aminomethyl)phosphonic acid (AMPA).
[2] European Food Safety Authority, 2011: *Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) No 1107/2009.* EFSA Journal 2011;9(2):2092. 49 pp, doi:10.2903/j.efsa.2011.2092.
[3] Appendix to EFSA Journal 2011;9(2):2092. *Further guidance on performing and presenting the literature search.* Available online: https://efsa.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.2903/j.efsa.2011.2092&file=efs22092-sup-0001-Appendix.pdf
[4] European Food Safety Authority, 2019. *Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances.* EFSA supporting publication 2019:EN-1612. 49 pp., doi:10.2903/sp.efsa.2019.EN-1612.
[5] All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

Category B Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
A justification for such decision is provided as recommended in the EFSA 2092 Guidance Document (GD). The list of these Category B articles and the justifications can be found in **Table 25** and **Table 26** of this Literature Review Report document.

Category C Articles for which relevance cannot be clearly determined.
As recommended in the EFSA 2092 Guidance Document (GD), an explanation is provided why the relevance could not be determined. The list of these Category C articles and the explanations can be found in **Table 27** and **Table** 28**28** of this Literature Review Report document.

The full outcome of the literature evaluation is provided in **Table 1**.

Table 1: Summary of the literature review

Section	Number of articles found	Rapid assessment (title/abstract level)		Detailed assessment (full-text level)	
		non-relevant articles	potentially relevant / unclear relevance	non-relevant articles	relevant articles (Category A+B+C)
Ecotoxicology	123	24	99	69	30
E-fate	83	18	65	49	16
Residues	13	12	1	0	1
Toxicology	106	30	76	45	31
Efficacy[a)]	2	0	2	2	0
Other non-relevant categories [b)]	2967	2966	1	1	0
Total	**3294**	**3048**	**244**	**166**	**78**

[a)] Efficacy / Agronomy (e.g. reporting desired effects on organisms to be controlled) and development of analytical methods (artificial measurements) do not provide information useful/required for the environmental or human safety risk assessment.
[b)] The category "other non-relevant categories" covers a wide range of scientific publications which are not related to glyphosate or its metabolites or are not related to exposure of humans or the environment to glyphosate or its metabolites and thus not relevant for the risk assessments.

The full outcome of the relevant articles after detailed (full-text) assessment is provided in **Table 2**.

Table 2: Relevant articles by full-text classified according to the EFSA 2092 GD, Point 5.4.1

	Relevant articles by full-text (EFSA 2092 GD, Point 5.4.1)		
Section	**Category A** [a)]	**Category B** [b)]	**Category C** [c)]
Ecotoxicology	7	22	1
E-fate	0	16	0
Residues	0	1	0
Toxicology	6	19	6
Efficacy	0	0	0
Total	**13**	**58**	**7**

[a)] Category A: Articles, which provide data for establishing or refining risk assessment parameters.
[b)] Category B: Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
[c)] Category C: Articles for which relevance cannot be clearly determined.

2 Introduction

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA Supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

This present Literature Review Report summarizes search and evaluation of glyphosate public literature, covering the publication period of 1st July 2006 to 31st December 2009.

The search has been conducted via the online service provider STN (www.stn-international.de) that provides access to a broad range of databases and to published research, journal literature, patents, structures, sequences, properties, and other data.

To offer a comprehensive literature search covering the requirements of the EFSA 2092 Guidance Document eleven databases have been used: AGRICOLA, BIOSIS, CABA, CAPLUS, EMBASE, ESBIOBASE, MEDLINE, TOXCENTER, FSTA, PQSCITECH, and SCISEARCH.

Please refer to **Table 3** for more details on the literature search.

Table 3: Overview of the search conducted for glyphosate and its metabolites

Performed for	Covering publication period	Conducted on
Glyphosate AMPA	October 2006 – December 2009	07 September 2021
Glyphosate AMPA	July 2006 – September 2006	14 October 2021

AMPA = (aminomethyl)phosphonic acid

A "focused search for grouped data requirements"[6] have been performed (a combination of a substance basic input parameters, keywords and "search filters" defined for the four technical sections –toxicology, residues, environmental fate, and ecotoxicology).

Please refer to **Chapter 2.2** and **2.3** (pages 13 and 145) for the input parameters, keywords and search filters used in the literature search.

Regarding details on the bibliographic databases used in the literature search, please refer to **Chapter 2.1** (**Table 4**).

Regarding the number of articles retrieved in the literature search, please refer to **Chapter 2.1** (**Table 5**).

For the relevance and reliability assessment, please refer to **Chapter 2.4** and **2.5** (pages 17 and 20).

[6] Citation from the EFSA 2092 Guidance Document: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

For the full outcome of the literature search for the individual technical sections, please refer to **Chapter 3** (page 25).

2.1 Bibliographic databases used in the literature search

Table 4: Overview of the databases used in the literature search

Data requirement(s) captured in the search	**Details of the search(es)**			
	1. AGRICOLA	**2. BIOSIS**	**3. CABA**	**4. CAPLUS**
Justification for choosing the source:	Provides literature from agriculture and related fields, e.g. biology, biotechnology, botany, ecology etc.	Provides the most comprehensive and largest life science literature, e.g. biosciences, biomedicine etc.	Covers literature from agriculture, food science, biotechnology, crop protection, crop sciences, environment, soils and fertilizers, etc.	Covers literature and patents from Analytical chemistry, Applied chemistry, Biochemistry, Chemical engineering, Macromolecular chemistry, Organic chemistry
Number of records in the database at the time of search:	> 6.7 million (09/2019)	> 27.8 million (04/2019)	> 9.9 million	> 6.7 million (09/2019)
Database update:	Monthly	Weekly	Weekly	Daily updates bibliographic data; weekly updates indexing data
Date of the search:	07-September-2021 14 October 2021	07-September-2021 14 October 2021	07-September-2021 14 October 2021	07-September-2021 14 October 2021
Database covers records:	1970-present	1926-present	1973-present	1907-present and more than 180,000 pre-1907
Date of the latest database update:	04-August-2021 11 October 2021	01-September-2021 13 October 2021	01-September-2021 13 October 2021	06-September-2021 13 October 2021
Language limit:	No	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	906 (07-09-2021) 0 (14-10-2021)	977 (07-09-2021) 51 (14-10-2021)	1908 (07-09-2021) 0 (14-10-2021)	1261 (07-09-2021) 52 (14-10-2021)

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	Details of the search(es)		
	5. EMBASE	**6. Esbiobase**	**7. Medline**
Justification for choosing the source:	Covers literature from biological science, biochemistry, drugs, environmetal science, pharmacy, etc.	Covers literature from microbiology, biotechnology, ecological and environmental sciences, plant science, toxicology, etc.	Covers literature from all areas of biomedicine.
Number of records in the database at the time of search:	>36.4 million (08/2019)	>9 million Static file	>33.5 million (01/2022)
Database update:	weekly	weekly	daily
Date of the search:	07-September-2021 14 October 2021	07-September-2021 14 October 2021	07-September-2021 14 October 2021
Database covers records:	1947-present	1994-2021	1946-present
Date of the latest database update:	06-September-2021 13 October 2021	01-September-2021 13 October 2021	06-September-2021 13 October 2021
Language limit:	no	no	no
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.		
Total number of records retrieved:	246 (07-09-2021) 22 (14-10-2021)	819 (07-09-2021) 0 (14-10-2021)	358 (07-09-2021) 17 (14-10-2021)

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	**Details of the search(es)**			
	8. PQSciTech	**9. SciSearch**	**10. ToxCenter**	**11. FSTA**
Justification for choosing the source:	Covers literature from a wide area of life sciences and engineering	Covers literature from agriculture, biology, biotechnology chemistry, ecology, genetics, plant sciences, etc	Covers literature about adverse drug reactions, chemically induced diseases, environmental pollution, pesticides and herbicides, toxicological analysis, etc.	Covers literature about biotechnology, food sciences, plant pathology etc.
Number of records in the database at the time of search:	>33.6 million (01/2021)	>47.7 million (08/2019)	>16.2 million (01/20222)	>1.59 million (09/2020)
Database update:	monthly	weekly	daily	monthly
Date of the search:	07-September-2021 14 October 2021	07-September-2021 14 October 2021	07-September-2021 14 October 2021	07-September-2021 14 October 2021
Database covers records:	1962-present	1974-present	1907-present	1969-present
Date of the latest database update:	24 August-2021 24 September 2021	06-September-2021 11 October 2021	06-September-2021 11 October 2021	06-September-2021 11 October 2021
Language limit:	no	no	no	no
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	1168 (07-09-2021) 0 (14-10-2021)	1211 (07-09-2021) 61 (14-10-2021)	822 (07-09-2021) 29 (14-10-2021)	38 (07-09-2021) 1 (14-10-2021)

Table 5: Total number of articles retrieved

Scope of the search	Total number of hits over all databases within the current search	After applying search filters [a] within the current search	After manual removal of duplicates [b] within the current search
October 2006 – December 2009 Glyphosate AMPA	**9714**	**9458**	**3253**
July 2006 – September 2006 Glyphosate AMPA	**233**	**230**	**41**

[a] Search filters applied for the four technical sections (residues, environmental fate, toxicology and ecotoxicology). Please refer to **Chapter 2.3** for more details (page 14).

[b] Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

2.2 Input parameters used in the literature search

The basic input parameters used in the literature search, e.g. IUPAC, chemical name or CAS number, are provided in **Table 6** - エラー! 参照元が見つかりません。**7**.

Table 6: Input parameters – active substance Glyphosate

Substance name	Glyphosate Salts: isopropylamine, potassium, ammonium, methylmethanamine
IUPAC / CA name	2-(phosphonomethylamino)acetic acid
CAS number(s)	1071-83-6 Salts: 38641-94-0, 70901-12-1, 39600-42-5, 69200-57-3, 34494-04-7, 114370-14-8, 40465-66-5, 69254-40-6

Table 7: Input parameters – metabolite AMPA

Substance name	AMPA
IUPAC / CA name	(aminomethyl)phosphonic acid
CAS number(s)	1066-51-9

2.3 Keywords and search filters used in the literature search

The approach used for the search was the “focused search for grouped data requirements”[7], which combines the active substance and metabolite basic input parameters, keywords and search filters defined for each technical section. Please refer to エラー! 参照元が見つかりません。 for more details on the keywords used and to **Table 9 - Table 19** for the search filters.

Table 8: Keywords used for the active substance glyphosate.

Gly: Glyphosate and AMPA	glyphosat? OR glifosat? OR glyfosat? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR 69254-40-6 OR aminomethyl phosphonic OR aminomethylphosphonic OR 1066-51-9

(1w) = proximity operator (this order, up to 1 word between)
AND / OR / NOT = boolean search operators
? = any character(s)

Table 9: Search filters related to the technical section toxicology

Toxicology [Gly] AND the following search filters
tox? OR hazard? OR adverse OR health OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR in vivo OR in vitro OR invivo OR invitro OR mode of action OR skin? OR eye? OR irrit? OR sensi? OR allerg? OR rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR metabolism OR metabolite? OR metabolic OR distribution OR adsorption OR excretion OR elimination OR kinetic OR cytochrome OR enzym? OR gen? OR muta? OR chromos? OR clastogen? OR DNA OR carcino? OR cancer? OR tumor? OR tumour? OR oncog? OR oncol? OR malign? OR immun? OR neur? OR endocrin? OR hormon? OR gonad? OR disrupt? OR reproduct? OR development? OR malform? OR anomal? OR fertil? OR foet? OR fet? OR matern? OR pregnan? OR embryo? OR epidem? OR medical? OR poison? OR exposure OR operator? OR bystander? OR resident? OR worker? OR occupat? biomonitoring OR human exposure OR microbiome OR oxidative stress OR apoptosis OR necrosis OR cytotoxicity OR Polyoxyethyleneamine OR POEA OR surfactant OR risk assessment?

Table 108: Search filters related to the technical section residues

Residues [Gly] AND the following search filters
uptake OR translocation OR rumen OR storage stability OR storage OR stability OR metabolic OR metabolism OR breakdown OR nature of residues OR residue? OR magnitude of residues OR process? OR effects of processing OR dessicant OR preharvest OR preemerg? OR ?resistant? OR ?toleran? OR transgenic OR hydroly? OR rotation? OR succeed? OR plant? OR crop? OR feed? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig? OR dietary OR assessment OR risk assessment OR consum? OR exposure

[7] Citation from the EFSA 2092 GD: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

Table 11: Search filters related to the technical section environmental fate

Environmental fate [Gly] AND the following search filters
soil OR water OR sediment OR degradat? OR photo? OR soil residues OR soil accumulat? OR soil contaminat? OR mobility OR sorption OR column leaching OR aged residue OR leach? OR lysimeter OR groundwater OR contaminat? OR microb? OR exudation OR rhizosphere OR dissipation OR saturated zone OR hydrolysis OR drift OR run-off OR runoff OR drainage OR volat? OR atmosphere OR long-range transport OR short-range transport OR transport OR micronutrient OR phosphate OR iron OR manganese OR half-life OR halflife OR half-lives OR halflives OR DT50 OR kinetics OR off-site movement OR removal OR drinking water OR water treatment processes OR atmospheric deposition OR tile-drains OR surface water OR monitoring data OR disinfectant OR ozone OR tillage OR infiltration OR hard surface OR rainwater OR rain water OR chelat? OR complex? OR mineralization OR persistence OR ligand

Table 19: Search filters related to the technical section ecotoxicology

Ecotoxicology [Gly] AND the following search filters
tox? OR ecotox? OR ?toxic OR ?toxicity OR hazard OR adverse OR endocrine disrupt? OR bioaccumulate? OR biomagnifi? OR bioconcentration OR poison OR effect OR indirect effect? OR direct effect? OR biodivers? OR protection goals OR eco? OR impact OR population OR OR community OR wildlife OR incident OR wildlife OR incident OR pest OR bird? OR acute OR chronic OR long-term OR mallard OR duck OR quail OR bobwhite OR Anas? OR Colinus? OR wild OR dietary OR aquatic OR fish OR daphni? OR alg? OR chiron? OR sediment dwell? OR benthic OR lemna OR marin? OR estuarine OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR plant AND submerge? OR emerge? OR bee? OR apis OR apidae OR bumble? OR colony OR hive OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR protection OR model? OR vole OR pest OR arthropod? OR beneficials OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR decompos? OR micro organisms OR microorganisms OR microbial OR carbon OR nitrogen OR plant? OR vegetative vigo? OR seedling OR germination OR monocot? OR dicot? OR sewage OR activated sludge OR biodegrad? OR bioaccumulation? OR amphib? OR reptile? OR aquatic plant OR beneficial

2.4 Relevance assessment

After removal of duplicates, the remaining articles were assessed for their relevance. First, at “title / abstract level” (so-called “rapid assessment”) and second, at “full-text level” (so called “detailed assessment”).
Articles that were identified as “non-relevant” in the rapid assessment were excluded from further evaluation and a justification for their non-relevance was provided.
For articles that were not excluded in the rapid assessment (potentially relevant articles and articles of an unclear relevance), a detailed relevance assessment of a full-text document was performed.
Articles that were identified as “non-relevant” in the detailed assessment were excluded from further evaluation and a justification for their non-relevance was provided.

For both assessments (rapid and detailed) the same criteria for non-relevance were applied (see **Chapter 2.4.1** and **2.4.2**).

2.4.1 Criteria applied for “non-relevance”

Articles identified as “non-relevant” in the rapid and detailed assessments belong to one of the following categories and were excluded from further evaluation. A justification for their non-relevance was provided.

- Publications related to efficacy (resistance related articles, new uses of control of pest / crops) or to agricultural / biological research (crop science, breeding, fertilization, tillage, fundamental plant physiology / micro- / molecular biology).
- Publications dealing with analytical methods / development.
- Publications describing new methods of synthesis (discovery / developments) or other aspects of basic (organic / inorganic) chemistry.
- Patents.
- Wastewater treatment.
- Abstracts referring to a conference contribution that does not contain sufficient data / information for regulatory risk assessment.
- Publications focusing on genetically modified organisms / transgenic crops; no data directly relevant to glyphosate evaluation (e.g. crop compositional analysis, gene flow, protein characterization).
- Publications where glyphosate or a relevant metabolite were not the focus of the publication.
- Secondary information including scientific and regulatory reviews[8].
- Articles dealing with political / socio / economic analysis.
- Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity).
- Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes.
- Findings not related to ecotoxicology, toxicology, residues, and environmental fate.
- Publications not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).

[8] Reviews have been partly evaluated on full text level as well – case by case decision.

- Publications dealing with a Roundup[9] formulation / other glyphosate formulations that is not the representative formulation for the AIR5 dossier and thus not relevant to the EU glyphosate renewal.
- Publications dealing with general pesticide exposures (not glyphosate specific).
- Publications generating endpoints that are not relatable to the EU level regulatory risk assessment (e.g. findings based on enzyme, cellular and molecular level etc.).
- Opinion articles where no new data is provided that can be used for the EU regulatory risk assessment.

2.4.2 Additional criteria for articles on the health and exposure of glyphosate

The scientific literature on the health effects of glyphosate can be subdivided in two main parts:

- Articles containing data on glyphosate acid and salts and on the reference glyphosate formulation MON 52276, and
- Articles only containing data on glyphosate formulations and/or co-formulants that have a composition different from that of the reference formulation MON 52276.

In the case of articles only relating to glyphosate formulations *in vitro* testing with the exception of cell/tissue systems[10] that are likely to come in direct contact with formulations and glyphosate formulations containing other active ingredients are excluded. The reason for the exclusion of *in vitro* testing of formulations to assess health effects as a result of systemic exposure is the presence of surfactants which produce cell toxicity based on the destabilization of the cell membrane and the mitochondrial membrane thus masking the specific toxicity of glyphosate. The toxicity of the co-formulants in combination with glyphosate is dependent on the concentration and the nature of the co-formulants and can be addressed on a case-by-case basis during the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

In the relevance of glyphosate data, those articles have been considered as not relevant (and reliable) for the assessment for systemic toxicity when only *in vitro* results are presented with glyphosate concentrations above 1 mM. This is because it is physiologically not possible to attain such concentrations in standard regulatory *in vivo* testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in *in vivo* test systems. It thus makes no sense to include such data in the risk assessment of glyphosate. Exceptions can be made in the event of direct contact with formulations resulting in localized effects, but then there is the contribution of the toxicity of the co-formulants which can be better addressed in the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

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[9] Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contains a surfactant polyethoxylated tallow amine (also polyoxyethyleneamine, POEA) which is not permitted for use in the EU. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in articles dealing with POEA based Roundup formulations cannot be related to the representative formulation MON 52276 which is quaternary-ammonium based (and not POEA based).

[10] Glyphosate-based herbicides (GBH) contain surfactants that destabilize the cell membrane and the mitochondrial membrane and thus produce a toxicity that is not representative for glyphosate (see Levine S. L. et al, *Cell Biol. Toxicol. (2007) 23:385-400*). This has been clearly demonstrated in the scientific literature and also in some papers reviewed for this submission where in vitro glyphosate toxicity is compared against that of GBH and surfactants.

The limit of 1 mM has been based on the single dose oral pharmacokinetic data of a formulation containing 71.7% w/w glyphosate where an oral dose of 1,430 mg/kg bw in the rat gives plasma levels of 38.1 µg/mL or 0.225 mM after 2 hours. When extrapolated linearly (which is possible for glyphosate because it is not subject to hepatic metabolism) this gives plasma levels of 53.3 µg/mL or 0.315 mM at 2 hours after oral intake of 2,000 mg/kg bw and 107 µg/mL or 0.630 mM at 2 hours after oral intake of 4,000 mg/kg bw. A systemic concentration of glyphosate of 1 mM would then represent an oral dose of more than 6,000 mg/kg bw which is completely unreasonable for repeat dose experimental *in vivo* testing under today's OECD test guidelines. The ADI for glyphosate of 0.5 mg/kg bw/day corresponds with a daily systemic concentration of 0.17 µg/mL or 1 µM when a 60 kg person with 36 L extracellular fluid is considered with a glyphosate oral bioavailability of 20%. The daily systemic dose of glyphosate on the day of application (i.e. highest exposure day), based on the geometric mean of 3.2 µg/L in urine, of glyphosate applicators in the US is approx. 0.0001 mg/kg bw/day (Acquavella, 2004[11]) which is 1000 times less than the systemic dose (0.1 mg/kg bw) corresponding with the ADI oral dose of 0.5 mg/kg bw with 20% oral bioavailability.

Many articles that have been considered relevant for the risk assessment of glyphosate and have been assessed for reliability on full text basis, contain experimental data as well on glyphosate as such as on formulations (different from MON 52276) and co-formulants. In such cases, only the toxicology data pertinent to glyphosate and to the reference formulation (if that can be clearly stated by the author of the article) are summarized and discussed. In the case of articles on exposure monitoring and epidemiology, exposure to glyphosate formulations are considered.

2.4.3 Categorization of "relevant" articles at full-text level

Articles that were not excluded in the detailed assessment (see **Chapter 2.4.1** and **2.4.2**) were categorized as recommended in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092, Point 5.4.1.

Category A *Studies that provide data for establishing or refining risk assessment parameters. These studies should be summarised in detail following the subsequent steps of the OECD Guidance documents (OECD, 2005; 2006) and should be considered for reliability.*

Category B Studies that are relevant to the data requirement, but in the opinion of the applicant provide only supplementary information that does not alter existing risk assessment parameters. A justification for such a decision should be provided.

Category C Studies for which relevance cannot be clearly determined. For each of these studies the applicants should provide an explanation of why the relevance of such studies could not be definitively determined.

The list of Category A articles can be found in **Table 23** and **Table 24**. The list of Category B articles and the justifications can be found in **Table 25** and **Table** 26**26**. The list of Category C articles and the explanations can be found in **Table 27** and **Table** 28**28**.

[11] Acquavella J. F. *et al.* (2004), Environmental Health Perspectives, 112(3), 321-326.

2.5 Reliability assessment

For articles, which were identified, in the detailed assessment, as relevant articles of Category A (see **Chapter 2.4.3**) a reliability assessment was performed. The reliability criteria for each technical section are summarized in **Table 103 - Table 151115**.

For relevant articles of Category A that were classified either as reliable or reliable with restrictions, summaries were compiled.
Articles of Category A which were classified as non-reliable were downgraded to articles of Category B and justification for such a decision was provided.

Table 103: Reliability criteria for ecotoxicology, environmental fate and residues

Applied for	Reliability criteria
Ecotoxicology, Environmental Fate, Residues	For guideline-compliant studies (GLP studies): OECD, OPPTS, ISO, and others. The validity/quality criteria listed in the corresponding guidelines are met.
Ecotoxicology, Environmental Fate, Residues	(No) previous exposure to other chemicals is documented (where relevant).
Ecotoxicology	For aquatic studies, the test substance is dissolved in water or where a carrier is required, it is appropriate (non-toxic) and a carrier control / positive control is considered in the test design.
Environmental Fate, Residues	The test substance is dissolved in water or non-toxic solvent.
Ecotoxicology, Environmental Fate, Residues	Test item is sufficiently documented, and reported (i.e. purity, source, content, storage conditions).
Ecotoxicology	For tests including vertebrates, compliance of the batches used in toxicity studies compared to the technical specification.
Ecotoxicology	Species used in the experiment are clearly reported, including source, experimental conditions (where relevant): strain, adequate age/life stage, body weight, acclimatization, temperature, pH, oxygen (dissolved oxygen for aquatic tests) content, housing, light conditions, humidity (terrestrial species) incubation conditions, feeding.
Ecotoxicology	The validity criteria from relevant test guidelines can be extrapolated across different species but not necessarily across different test designs. If different, then the nature of the difference and impact should ideally be discussed.
Ecotoxicology, Environmental Fate, Residues	Only glyphosate or its metabolites is the test substance (excluding mixture), and information on application of the test substance is described.
Ecotoxicology, Environmental Fate, Residues	The endpoint measured can be considered a consequence of glyphosate (or a glyphosate metabolite).
Ecotoxicology, Environmental Fate, Residues	Study design / test system is well described, including when relevant: concentration in exposure media (dose rates, volume applied, etc.), dilution/mixture of test item (solvent, vehicle) where relevant.
Ecotoxicology, Environmental Fate, Residues	Analytical verifications performed in test media (concentration) / collected samples, stability of the test substance in test medium should be documented.

Applied for	Reliability criteria
Ecotoxicology	The test has been performed in several dose levels (at least 3) including a positive / negative control where relevant.
Ecotoxicology	Suitable exposure throughout the whole exposure period was demonstrated and reported.
Ecotoxicology	A clear concentration response relationship is reported – in studies where the dose response test design is employed.
Ecotoxicology	A sufficient number of animals per group to facilitate statistical analysis reported: mortality in control groups reported, observations/findings in positive/negative control clearly reported (where relevant).
Ecotoxicology, Environmental Fate, Residues	Assessment of the statistical power of the assay is possible with reported data.
Ecotoxicology, Environmental Fate, Residues	Statistical methodology is reported (e.g., checking the plots and confidence intervals).
Ecotoxicology	Description of the observations (including time-points), examinations, and analyses performed, with (where relevant) dissections being well documented.
Ecotoxicology	For terrestrial ecotoxicological studies in the laboratory or the field, the substrates used should be adequately described e.g. nature of substrate i.e. species of leaf or soil type.
Ecotoxicology, Environmental Fate, Residues	Field locations relevant / comparable to European conditions.
Ecotoxicology, Environmental Fate, Residues	Characterization of soil: texture (sandy loam, silty loam, loam, loamy sand), pH (5.5-8.0), cation exchange capacity, organic carbon (0.5-2-5%), bulk density, water retention, microbial biomass (~1% of organic carbon).
Ecotoxicology, Environmental Fate	Other soils where information on characterization by the parameters: pH, texture, CEC, organic carbon, bulk density, water holding capacity, microbial biomass.
Ecotoxicology, Environmental Fate, Residues	For tests including agricultural soils, they should not have been treated with test substance or similar substances for a minimum of 1 year.
Ecotoxicology, Environmental Fate	For soil samples, sampling from A-horizon, top 20 cm layers; soils freshly from field preferred (storage max 3 months at 4 +/- 2°C).
Ecotoxicology, Environmental Fate, Residues	Data on precipitation is recorded.
Environmental Fate	The temperature was in the range between 20-25°C and the moisture was reported.
Environmental Fate	The presence of glyphosate identified in samples were collected from European groundwater, soil, surface waters, sediments or air.
Ecotoxicology	For lab terrestrial studies, the temperature was appropriate to the species being tested and generally should fall within the range between 20-25°C and soil moisture / relative humidity was reported.
Ecotoxicology	For bee studies, temperature of the study should be appropriate to species.
Ecotoxicology	For lab aquatic studies:
	The source and / or composition of the media used should be described.
	The temperature of the water should be appropriate to the species being tested and generally fall within the 15-25ºC.

Applied for	**Reliability criteria**
Ecotoxicology, Residues	The residue data can be linked to a clearly described GAP table, appropriate in the context of the renewal of approval of glyphosate (crop, application method, doses, intervals, PHI).
Ecotoxicology, Environmental Fate, Residues	Analytical results present residues measurements which can be correlated with the existing residues definition of glyphosate, and where relevant its metabolites.
Ecotoxicology, Environmental Fate, Residues	Analytical methods are clearly described; and adequate statement of specificity and sensitivity of the analytical methods is included.
Ecotoxicology	Assessment of the ECX for the width of the confidence interval around the median value; and the certainty on the level of protection offered by the median ECX is reported.
Environmental Fate	Radiolabel characterization: purity, specific activity, location of label is reported.
Environmental Fate	If degradation kinetics are included: data tables / model description / statistical parameters for kinetic fit to be provided.
Environmental Fate, Residues	Monitoring data: description of matrix analysed, and analytical methods to be fully described.
Environmental Fate	Clear description of application rate and relevance to approved uses.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 14: Reliability criteria for toxicology – epidemiology and exposure studies

Reliability criteria – toxicology	
Epidemiology studies	**Exposure studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines/practices	Study in accordance to valid internationally accepted testing guidelines/practices
Study completely described and conducted following scientifically acceptable standards	Study performed according to GLP
	Study completely described and conducted following scientifically acceptable standards
Test substance	**Test substance**
Exposure to formulations with only glyphosate as a.i.	Exposure to formulations with only glyphosate as a.i.
Exposure to formulations with glyphosate combined with other a.i.	Exposure to formulations with glyphosate combined with other a.i.
Exposure to various formulations of pesticides	Exposure to various formulations of pesticides
Study	**Study**
Study design – epidemiological method followed	Study design clearly described
Description of population investigated	Population investigated sufficiently described
Description of exposure circumstances	Exposure circumstances sufficiently described
Description of results	Sampling scheme sufficiently documented
Have confounding factors been considered	Analytical method described in detail
Statistical analysis	Validation of analytical method reported
	Monitoring results reported
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 1511: Reliability criteria for toxicology – *in vitro* and *in vivo* studies

Reliability criteria – toxicology and metabolism	
***In vitro* studies**	***In vivo* studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines	Study in accordance to valid internationally accepted testing guidelines.
Study performed according to GLP	Study performed according to GLP
Study completely described and conducted following scientifically acceptable standards	Study completely described and conducted following scientifically acceptable standards
Test substance	**Test substance**
Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions)	Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions)
Only glyphosate acid or one of its salts is the tested substance	Only glyphosate acid or one of its salts is the tested substance
AMPA is the tested substance	AMPA is the tested substance
Study	**Study**
Test system clearly and completely described	Test species clearly and completely described
Test conditions clearly and completely described	Test conditions clearly and completely described
Metabolic activation system clearly and completely described	Route and mode of administration described
Test concentrations in physiologically acceptable range (< 1 mM)	Dose levels reported
Cytotoxicity tests reported	Number of animals used per dose level reported
Positive and negative controls	Method of analysis described for analysis test media
Complete reporting of effects observed	Validation of the analytical method
Statistical methods described	Analytical verifications of test media
Historical negative and positive control data reported	Complete reporting of effects observed
Dose-effect relationship reported	Statistical methods described
	Historical control data of the laboratory reported
	Dose-effect relationship reported
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

3 Search results

The full outcome of the literature search and evaluation is provided below.

Table 16: Summary of the literature search – all technical sections

	Number	Justification
Total number of articles retrieved from the search.	9947	n.a.
Total number of articles after removal of duplicates within all databases.	n.a.	n.a.
Total number of articles after manual removal of duplicates.	3294	n.a.
Number of articles excluded after rapid assessment (title / abstract).	3050	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	244	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	166	See Table 2929
Number of articles not excluded after detailed assessment. [a)]	78	See Table 23-Table 2828
Number of summaries presented in the dossier. [b)]	13	See Table 23, Table 2424

[a)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[b)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 17: Results of the article selection process for ecotoxicology

	Number	Justification
Total number of articles after manual removal of duplicates.	123	n.a.
Number of articles excluded after rapid assessment (title / abstract).	24	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	99	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	69	See Table 2929
Number of articles not excluded after detailed assessment. [a)]	30	See Table 23-Table 2828
Number of summaries presented in the dossier. [b)]	7	See Table 23, Table 2424

[a)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[b)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 18: Results of the article selection process for environmental fate

	Number	Justification
Total number of articles after manual removal of duplicates.	80	n.a.
Number of articles excluded after rapid assessment (title / abstract).	18	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	65	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	49	See Table 2929
Number of articles not excluded after detailed assessment. [a)]	16	See Table 23-Table 2828
Number of summaries presented in the dossier. [b)]	0	n.a.

[a)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[b)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 19: Results of the article selection process for residues

	Number	Justification
Total number of articles after manual removal of duplicates.	13	n.a.
Number of articles excluded after rapid assessment (title / abstract).	12	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	1	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	0	See Table 2929
Number of articles not excluded after detailed assessment [a)]	1	See Table 23-Table 2828
Number of summaries presented in the dossier [b)]	0	n.a.

[a)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[b)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 20: Results of the article selection process for toxicology

	Number	Justification
Total number of articles after manual removal of duplicates	106	n.a.
Number of articles excluded after rapid assessment (title / abstract).	30	See the Literature Review Excel File.
Total number of full-text documents assessed in detail	76	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	45	See Table 2929
Number of articles not excluded after detailed assessment [a)]	31	See Table 23-Table 2828
Number of summaries presented in the dossier [b)]	6	See Table 23, Table 2424

[a)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[b)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 21: Results of the article selection process for efficacy

	Number	Justification
Total number of articles after manual removal of duplicates.	2	n.a.
Number of articles excluded after rapid assessment (title / abstract).	0	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	2	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	2	See Table 2929
Number of articles not excluded after detailed assessment. [a)]	0	n.a.
Number of summaries presented in the dossier. [b)]	0	n.a.

[a)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[b)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 22: Results of the article selection process for "other non-relevant categories"

	Number	**Justification**
Total number of articles after manual removal of duplicates.	2967	n.a.
Number of articles excluded after rapid assessment (title / abstract).	2966	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	1	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	1	See Table 2929
Number of articles not excluded after detailed assessment. [a)]	0	n.a.
Number of summaries presented in the dossier. [b)]	n.a.	n.a.

[a)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[b)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 23: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Classification (cat a/b/c) /justification
3031	CA 5.1.1	Anadon et al.	2009	Toxicokinetics of glyphosate and its metabolite aminomethyl phosphonic acid in rats .	Toxicology letters, (2009 Oct 08) Vol. 190, No. 1, pp. 91-5	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
140	CA 5.9.4.	Andreotti et al.	2009	Agricultural pesticide use and pancreatic cancer risk in the Agricultural Health Study Cohort.	International Journal of Cancer, (15 May 2009) Vol. 124, No. 10, pp. 2495-2500	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2209	CA 5.9.4.	Hoppin et al.	2006	Pesticides and adult respiratory outcomes in the agricultural health study.	Ann. N. Y. Acad. Sci., Vol. 1076, Issue Living in a Chemical World, Page 343-354, Publication Year 2006	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2206	CA 5.9.4.	Lee et al.	2007	Pesticide use and colorectal cancer risk in the Agricultural Health Study.	Int. J. Cancer, Vol. 121, Issue 2, Page 339-346, Publication Year 2007	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
1697	CA 5.9.4.	Weselak et al.	2007	In utero pesticide exposure and childhood morbidity.	Environmental Research, (JAN 2007) Vol. 103, No. 1, pp. 79-86	5.4.1 case a) relevant and provides data for the risk assessment: This was a retrospective cohort study conducted in Canada as part of the Ontario Farm Family Health Study (OFFHS). A short summary for this article is provided.
2196	CA 5.9.4.	Eriksson et al.	2008	Pesticide exposure as risk factor for non-Hodgkin lymphoma including histopathological subgroup analysis.	International journal of cancer, (2008 Oct 01) Vol. 123, No. 7, pp. 1657-63.	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3084	CA 8.1.4 CA 8.7	Rohr et al.	2008	Understanding the net effects of pesticides on amphibian trematode infections.	Ecological applications : a publication of the Ecological Society of America, (2008 Oct) Vol. 18, No. 7, pp. 1743-53	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3012	CA 8.2.1	Langiano Vivian Do Carmo et al.	2008	Toxicity and effects of a glyphosate -based herbicide on the Neotropical fish Prochilodus lineatus.	Comparative biochemistry and physiology. Toxicology and pharmacology : CBP, (2008 Mar) Vol. 147, No. 2, pp. 222-31	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
1124	CA 8.2.1 CA 8.2.2	Stehr et al.	2009	Evaluating the Effects of Forestry Herbicides on Fish Development Using Rapid Phenotypic Screens	North American Journal of Fisheries Management [N. Am. J. Fish. Manage.]. Vol. 29, no. 4, pp. 975-984. Aug 2009	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3016	CA 8.2.4.1 CA 8.2.6.1	Pereira et al.	2009	Toxicity evaluation of three pesticides on non-target aquatic and soil organisms: commercial formulation versus active ingredient.	Ecotoxicology (London, England), (2009 May) Vol. 18, No. 4, pp. 455-63	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
100	CA 8.2.4.2 CA 8.2.5.2	Bringolf et al.	2007	Acute and chronic toxicity of glyphosate compounds to glochidia and juveniles of Lampsilis siliquoidea (Unionidae).	Environmental toxicology and chemistry, (2007 Oct) Vol. 26, No. 10, pp. 2094-100	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
834	CA 8.2.6.1	Vendrell et al.	2009	Effect of glyphosate on growth of four freshwater species of phytoplankton: a microplate bioassay.	Bulletin of environmental contamination and toxicology, (2009 May) Vol. 82, No. 5, pp. 538-42	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Classification (cat a/b/c) /justification
413	CP 10.6.2 CA 8.2.7 CA 8.2.6.1	Cedergreen et al.	2007	Combination effects of herbicides on plants and algae: do species and test systems matter?	Pest Management Science (2007), 63(3), 282-295	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

Table 24: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Classification (cat a/b/c) /justification
3031	Anadon et al.	CA 5.1.1	2009	Toxicokinetics of glyphosate and its metabolite aminomethyl phosphonic acid in rats .	Toxicology letters, (2009 Oct 08) Vol. 190, No. 1, pp. 91-5	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
140	Andreotti et al.	CA 5.9.4.	2009	Agricultural pesticide use and pancreatic cancer risk in the Agricultural Health Study Cohort.	International Journal of Cancer, (15 May 2009) Vol. 124, No. 10, pp. 2495-2500	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
100	Bringolf et al.	CA 8.2.4.2 CA 8.2.5.2	2007	Acute and chronic toxicity of glyphosate compounds to glochidia and juveniles of Lampsilis siliquoidea (Unionidae).	Environmental toxicology and chemistry, (2007 Oct) Vol. 26, No. 10, pp. 2094-100	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
413	Cedergreen et al.	CP 10.6.2 CA 8.2.7 CA 8.2.6.1	2007	Combination effects of herbicides on plants and algae: do species and test systems matter?	Pest Management Science (2007), 63(3), 282-295	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2196	Eriksson et al.	CA 5.9.4.	2008	Pesticide exposure as risk factor for non-Hodgkin lymphoma including histopathological subgroup analysis.	International journal of cancer, (2008 Oct 01) Vol. 123, No. 7, pp. 1657-63.	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2209	Hoppin et al.	CA 5.9.4.	2006	Pesticides and adult respiratory outcomes in the agricultural health study.	Ann. N. Y. Acad. Sci., Vol. 1076, Issue Living in a Chemical World, Page 343-354, Publication Year 2006	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3012	Langiano Vivian Do Carmo et al.	CA 8.2.1	2008	Toxicity and effects of a glyphosate -based herbicide on the Neotropical fish Prochilodus lineatus.	Comparative biochemistry and physiology. Toxicology and pharmacology : CBP, (2008 Mar) Vol. 147, No. 2, pp. 222-31	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2206	Lee et al.	CA 5.9.4.	2007	Pesticide use and colorectal cancer risk in the Agricultural Health Study.	Int. J. Cancer, Vol. 121, Issue 2, Page 339-346, Publication Year 2007	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3016	Pereira et al.	CA 8.2.4.1 CA 8.2.6.1	2009	Toxicity evaluation of three pesticides on non-target aquatic and soil organisms: commercial formulation versus active ingredient.	Ecotoxicology (London, England), (2009 May) Vol. 18, No. 4, pp. 455-63	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3084	Rohr et al.	CA 8.1.4 CA 8.7	2008	Understanding the net effects of pesticides on amphibian trematode infections.	Ecological applications : a publication of the Ecological Society of America, (2008 Oct) Vol. 18, No. 7, pp. 1743-53	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
1124	Stehr et al.	CA 8.2.1 CA 8.2.2	2009	Evaluating the Effects of Forestry Herbicides on Fish Development Using Rapid Phenotypic Screens	North American Journal of Fisheries Management [N. Am. J. Fish. Manage.]. Vol. 29, no. 4, pp. 975-984. Aug 2009	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
834	Vendrell et al.	CA 8.2.6.1	2009	Effect of glyphosate on growth of four freshwater species of phytoplankton: a microplate bioassay.	Bulletin of environmental contamination and toxicology, (2009 May) Vol. 82, No. 5, pp. 538-42	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Classification (cat a/b/c) /justification
1697	Weselak et al.	CA 5.9.4.	2007	In utero pesticide exposure and childhood morbidity.	Environmental Research, (JAN 2007) Vol. 103, No. 1, pp. 79-86	5.4.1 case a) relevant and provides data for the risk assessment: This was a retrospective cohort study conducted in Canada as part of the Ontario Farm Family Health Study (OFFHS). A short summary for this article is provided.

Table 25: Relevant but supplementary (category B) articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
243	CA 5.7	Radio et al.	2008	Assessment of Chemical Effects on Neurite Outgrowth in PC12 cells Using High Content Screening.	Toxicol. Sci., Vol. 105, Issue 1, Page 106-118, Publication Year 2008	5.4.1 case b) relevant but supplementary information: The data presented in this study provide only supportive information for the risk assessment regarding effect of glyphosate on outgrowth of neurites in differentiated Neuroscreen-1 cells.
1336	CA 5.8.1	Manas et al.	2009	Genotoxicity of AMPA, the environmental metabolite of glyphosate , assessed by the Comet assay and cytogenetic tests.	Ecotoxicology and environmental safety, (2009 Mar) Vol. 72, No. 3, pp. 834-7	5.4.1 case b) relevant but supplementary information: The publication is providing genotoxcity information on AMPA via in vitro Comet assay in Hep-2, chromosome aberration test in human lymphocytes and in vivo micronucleus test in mice. The article was downgraded to Category B due to its non-reliability.
174	CA 5.8.2	Abass et al.	2009	An evaluation of the cytochrome P450 inhibition potential of selected pesticides in human hepatic microsomes.	J. Environ. Sci. Health, Part B, Vol. 44, Issue 6, Page 553-563, Publication Year 2009	5.4.1 case b) relevant but supplementary information: The study provides only supplementary information on hepatic CYP interaction in vitro; results do not change the existing risk assessment.
332	CA 5.8.2	Chan et al.	2007	Cardiovascular effects of herbicides and formulated adjuvants on isolated rat aorta and heart.	Toxicol. in Vitro, Vol. 21, Issue 4, Page 595-603, Publication Year 2007	5.4.1 case b) relevant but supplementary information: The article is relevant for the risk assessment since it analyses the effects on cardiovascular cells exposed to glyphosate technical grade. Although only additional information is provided for the risk assessment.
598	CA 5.8.2	Hultberg et al.	2007	Cysteine turnover in human cell lines is influenced by glyphosate .	Environmental Toxicology and Pharmacology, (JUL 2007) Vol. 24, No. 1, pp. 19-22	5.4.1 case b) relevant but supplementary information: The article is providing only supplementary information for the risk assessment regarding the effect of Glyphosate to intra and extra cellular cysteine and glutathione levels.
1296	CA 5.8.2	Mclaughlin et al.	2008	Functional expression and comparative characterization of nine murine cytochromes P 450 by fluorescent inhibition screening	Drug Metabolism and Disposition, (2008) Vol. 36, No. 7, pp. 1322-1331	5.4.1 case b) relevant but supplementary information: The data presented in this study provide only supportive information for the risk asessment regarding potential interaction of glyphosate with mouse and human P450s involved in xenobiotic metabolism.
155	CA 5.8.3	Hokanson et al.	2007	Alteration of estrogen-regulated gene expression in human cells induced by the agricultural and horticultural herbicide glyphosate .	Human and experimental toxicology, (2007 Sep) Vol. 26, No. 9, pp. 747-52	5.4.1 case b) relevant but supplementary information: The toxicity of glyphosate poduct (15%) was examined as a function of its capacity to alter gene expression (29 up and down regulated genes) in the presence or absence of estrogen. Temporal altered gene expression is not a biomarker for toxicity, but rather, may be within the range of normal biological responses of homeostasis. In vitro cytotoxicity of surfactants, however, is a significant confounder in data interpretation. Data do not reflect real in vivo exposure situations, and therefore only provides supporting information for human risk assessment purposes.
297	CA 5.9.4.	Bolognesi et al.	2009	Biomonitoring of genotoxic risk in agricultural workers from five colombian regions: association to occupational exposure to glyphosate .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 986-97	5.4.1 case b) relevant but supplementary information: This article was downgraded to Category B due to its non-reliability. This publication is considered relevant for the risk assessment of glyphosate, but as supplementary material, and as not reliable. Information necessary to classify health outcome was not collected

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						at the individual participant level; it is not possible to assess the health outcome in relation to any exposure using the results reported in this study. Additionally, exposure classification was based on self-reported glyphosate exposure, an indirect method by which to estimate exposure status of study participants. No biological evidence is provided to support exposure classification of study participants. Misclassification of either exposure, outcome, or both is possible in this study.
2270	CA 5.9.4.	Caldas et al.	2008	Poisonings with pesticides in the Federal District of Brazil.	Clin. Toxicol., Vol. 46, Issue 10, Page 1058-1063, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
108	CA 5.9.4.	Calvert et al.	2008	Acute pesticide poisoning among agricultural workers in the United States, 1998-2005.	American Journal of Industrial Medicine, (December 2008) Vol. 51, No. 12, pp. 883-898	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2198	CA 5.9.4.	Dasgupta et al.	2007	Pesticide poisoning of farm workers-implications of blood test results from Vietnam.	Int. J. Hyg. Environ. Health, Vol. 210, Issue 2, Page 121-132, Publication Year 2007	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
377	CA 5.9.4.	Firth et al.	2007	Chemical exposure among NZ farmers.	International journal of environmental health research, (2007 Feb) Vol. 17, No. 1, pp. 33-43	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2208	CA 5.9.4.	Horiuchi et al.	2008	Pesticide-related dermatitis in Saku district, Japan, 1975-2000.	International journal of occupational and environmental health, (2008 Jan-Mar) Vol. 14, No. 1, pp. 25-34	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
136	CA 5.9.4.	Naidoo et al.	2008	Agricultural activities, pesticide use and occupational hazards among women working in small scale farming in Northern KwaZulu-Natal, South Africa.	Int. J. Occup. Environ. Health, Vol. 14, Issue 3, Page 218-224, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
3281	CA 5.9.4.	Recena et al.	2006	Pesticides exposure in Culturama, Brazil-Knowledge, attitudes, and practices	Environmental Research, (2006) Vol. 102, No. 2, pp. 230-236	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2416	CA 5.9.4.	Sanin et al.	2009	Regional differences in time to pregnancy among fertile women from five Colombian regions with different use of glyphosate .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 949-60	5.4.1 case b) relevant but supplementary information: This article was downgraded to Category B due to its non-reliability. This publication is considered relevant for the risk assessment of glyphosate, but as supplementary material, and as not reliable. Information necessary to classify health outcome was not collected at the individual participant level; no biological evidence is provided to support exposure classification of study participants. Misclassification of exposure is possible in this study. It is not possible to assess the health outcome in relation to exposure using the results reported in this study.
1257	CA 5.9.4.	Settimi et al.	2008	Findings from the Italian Program for Surveillance of Acute Pesticide-related Illness, 2005	Clinical Toxicology [Clin. Toxicol.], (20080600) vol. 46, no. 5, p. 388	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
2418	CA 5.9.4.	Sudakin et al.	2009	Regional variation in the severity of pesticide exposure outcomes: applications of geographic information systems and spatial scan statistics	Clinical Toxicology, (2009) Vol. 47, No. 3, pp. 248-252	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
1006	CA 6.5.3	Saka et al.	2008	Effects of processing and cooking on the levels of pesticide residues in soybean samples.	Shokuhin Eiseigaku Zasshi, (JUN 2008) Vol. 49, No. 3, pp. 160-167.	5.4.1 case b) relevant but supplementary information: It provides the information on Pfs that can be used supportive of setting the MRLs. However, in the current Japanese MRL setting system, the MRL for soybean is set for RAC and Pfs for soy bean products are not reflected into the dietary risk assessment.
1231	CA 7.1.2	Simonsen et al.	2008	Fate and availability of glyphosate and AMPA in agricultural soil .	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2008 Jun) Vol. 43, No. 5, pp. 365-75	5.4.1 case b) relevant but supplementary information: The experimental setup and analytical method are quite well described. The study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Tested soil was not glyphosate free.
623	CA 7.1.2 CA 7.1.3.1	Mamy et al.	2007	Desorption and time-dependent sorption of herbicides in soils	European journal of soil science (2007) , Vol. 58, No. 1, pp. 174-187	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method are quite well described. The study has some deficiencies and results are not presented in detail. Thus, endpoints cannot be verified.
1000	CA 7.1.3.1	Caceres-Jensen et al.	2009	Adsorption of glyphosate on variable-charge, volcanic ash-derived soils .	Journal of environmental quality, (2009 Jul-Aug) Vol. 38, No. 4, pp. 1449-57	5.4.1 case b) relevant but supplementary information: Volcanic ash soils were investigated. These are not relevant for EU but can be relevant for Japan. The experimental setup is quite well described. The study has some deficiencies and results are not presented in detail. Thus, endpoints cannot be verified.
1576	CA 7.1.3.1	Farenhorst et al.	2008	Herbicide sorption coefficients in relation to soil properties and terrain attributes on a cultivated prairie.	Journal of environmental quality, (2008 May-Jun) Vol. 37, No. 3, pp. 1201-8	5.4.1 case b) relevant but supplementary information: The article investigated the adsorption of glyphosate on soil. 287 surface soils (0–15 cm) collected in a 10 × 10 m grid across a heavily eroded, undulating, calcareous prairie landscape in Minnesota (U.S.). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Adsorption coefficients are only presented a mean values for respective slopes of the sampling location. The study is considered not reliable.
1722	CA 7.1.3.1	Accinelli et al.	2006	Influence of Cry1Ac toxin on mineralization and bioavailability of glyphosate in soil .	Journal of agricultural and food chemistry (2006) , Vol. 54, No. 1, pp. 164-169	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
1896	CA 7.1.3.1	Candela et al.	2007	Laboratory studies on glyphosate transport in soils of the Maresme area near Barcelona, Spain: Transport model parameter estimation.	Geoderma, (JUN 15 2007) Vol. 140, No. 1-2, pp. 8-16	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
2669	CA 7.1.3.1	Sorensen et al.	2006	Sorption , desorption and mineralisation of the herbicides	Environmental pollution (2006) , Vol. 141, No. 1, pp. 184-194	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
				glyphosate and MCPA in samples from two Danish soil and subsurface profiles.		deficiencies and results are not presented in details. One soil site was heavily used for agriculture in the past - the usage of glyphosate is likely. Thus, endpoints cannot be verified. Experiments were performed at 10°C. Additionally, no parental mass balance was established.
2671	CA 7.1.3.1	Al-Rajab et al.	2008	Sorption and leaching of 14 C-glyphosate in agricultural soils	Agronomy for Sustainable Development (Jul 2008) Vol. 28, No. 3, pp. 419-428	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. However, details in the method description are unclear (especially equilibration time). Study has some deficiencies and results are not presented in details. Additionally, no parental mass balance was established. Thus, endpoints cannot be verified.
3128	CA 7.1.3.1	Jacobsen et al.	2008	Variation of MCPA, metribuzine, methyltriazine-amine and glyphosate degradation, sorption, mineralization and leaching in different soil horizons.	Environ. Pollut. (Oxford, U. K.), Vol. 156, Issue 3, Page 794-802, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Experiments were performed at 10°C and only one concentration was used. Additionally, no parental mass balance was established.
3130	CA 7.1.3.1	Farenhorst et al.	2009	Variations in soil properties and herbicide sorption coefficients with depth in relation to PRZM (pesticide root zone model) calculations	Geoderma (2009) , Vol. 150, No. 3-4, pp. 267-277 Source Note: 2009 May 15, v. 150, issue 3-4	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Additionally, no parental mass balance was established. Thus, endpoints cannot be verified.
1010	CA 7.1.3.1	Laitinen et al.	2008	Effects of soil phosphorus status on environmental risk assessment of glyphosate and glufosinate-ammonium.	J. Environ. Qual., Volume 37, Issue 3, Page 830-838, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described, however several details are not reported (e.g. which phase was analysed). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
2174	CA 7.1.3.1.1 CA 7.1.3.1.2	Gjettermann et al.	2009	Particle-facilitated pesticide leaching from differently structured soil monoliths.	Journal of environmental quality, (2009 Nov-Dec) Vol. 38, No. 6, pp. 2382-93	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described, however several details are not reported (e.g. which phase was analysed). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
2026	CA 7.1.4.2	Grundmann et al.	2008	Mineralization and Transfer Processes of 14C-labeled Pesticides in Outdoor Lysimeters	Water, air and soil pollution. Focus (2008) , Vol. 8, No. 2, pp. 177-185	5.4.1 case b) relevant but supplementary information: The study has several deficinecies. Furthermore, experimental set-up and analytical results are not described in detail.
1442	CA 7.1.4.3	Laitinen et al.	2009	Glyphosate and phosphorus leaching and residues in boreal sandy soil	PLANT AND SOIL, (OCT 2009) Vol. 323, No. 1-2, Sp. iss. SI, pp. 267-283	5.4.1 case b) relevant but supplementary information: The study does not represent worst case condition. The study period was dry in the whole Southern and Central Finland causing exceptionally low groundwater table levels and droughts in spring 2003. During the whole study the total precipitation was 867 mm in the experimental field, representing 80% of the long-term precipitation. Furthermore, the leaching field was situated in an intensively cultivated region,

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						where the use of glyphosate is common.
1238	CA 7.2.1.2	Chen et al.	2007	Fe(III)-pyruvate and Fe(III)-citrate induced photodegradation of Glyphosate in aqueous solutions	Journal of Coordination Chemistry, (2007) Vol. 60, No. 22, pp. 2431-2439	5.4.1 case b) relevant but supplementary information: The article shows that glyphosate is stable to photolysis at wavelengths ≥365 nm. According to the guideline, wavermength ≥290 nm should be investigated.
644	CA 7.5	Popp et al.	2008	Determination of glyphosate and AMPA in surface and waste water using high-performance ion chromatography coupled to inductively coupled plasma dynamic reaction cell mass spectrometry (HPIC-ICP-DRC-MS)	Analytical and bioanalytical chemistry (2008) , Vol. 391, No. 2, pp. 695-699	5.4.1 case b) relevant but supplementary information: Details on sampling like exact location, timing, duration and sampling method are not available. Therefore, results cannot be related to the application schedule of glyphosate. Furthermore, available information on the analytical method and its validation does not allow for a full assessment of its acceptability.
23	CA 8.1.4 CA 8.2.8	Relyea et al.	2009	A cocktail of contaminants: how mixtures of pesticides at low concentrations affect aquatic communities .	Oecologia, (2009 Mar) Vol. 159, No. 2, pp. 363-76	5.4.1 case b) relevant but supplementary information: Provides information on the effects of glyphosate on phytoplankton, zooplankton and periphyton and larval development of ambphibians but no risk assessment relevant endpoints are presented.
996	CA 8.1.5	Quassinti et al.	2009	Effects of paraquat and glyphosate on steroidogenesis in gonads of the frog Rana esculenta in vitro	Pesticide biochemistry and physiology (2009) , Vol. 93, No. 2, pp. 91-95	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
1601	CA 8.2.1	Ayoola et al.	2008	Histopathological effects of glyphosate on juvenile African catfish (Clarias gariepinus).	American-Eurasian Journal of Agricultural and Environmental Science (2008) , Vol. 4, No. 3, pp. 362-367	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3269	CA 8.2.1	Carriquiriborde et al.	2006	Ecotoxicological studies on the pejerrey (Odontesthes bonariensis, Pisces Atherinopsidae).	Biocell, (2006) Vol. 30, No. 1, pp. 97-109	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3024	CA 8.2.1 / CP 10.2.1	Ayoola et al.	2008	Toxicity of glyphosate herbicide on Nile tilapia (Oreochromis niloticus) juvenile.	African Journal of Agricultural Research (2008) , Vol. 3, No. 12, pp. 825-834	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
197	CA 8.2.4.1 CA 8.2.4.2	Dominguez-Cortinas et al.	2008	Analysis of the toxicity of glyphosate and Faena (R) using the freshwater invertebrates	Toxicological and Environmental Chemistry, (2008) Vol. 90, No. 2, pp. 377-384	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
				Daphnia magna and Lecane quadridentata.		item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
1119	CA 8.2.4.1 CA 8.2.4.2	Melnichuk et al.	2007	Estimation of toxicity of glyphosate -based herbicides by biotesting method using Cladocera.	Hydrobiological Journal, (2007) Vol. 43, No. 3, pp. 80-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3028	CA 8.2.4.2 CA 8.2.5.2	Achiorno et al.	2008	Toxicity of the herbicide glyphosate to Chordodes nobilii (Gordiida, Nematomorpha).	Chemosphere, (2008 May) Vol. 71, No. 10, pp. 1816-22	5.4.1 case b) relevant but supplementary information: Data on adult mortality are not relevant, because the test was conducted with a Roundup formulation. The endpoint for larvae is based on infective capacity (of previously exposed larvae or embryos) for which significant differences compared to control were demonstrated at all tested concentrations. Therefore, a LOEC is the only endpoint that can be established from this study and a LOEC cannot be used in the aquatic RA. Results are considered as only supportive.
939	CA 8.2.4.2 CA 8.2.5.2	Melnichuk et al.	2007	Effects of Fakel herbicide on vital activity of Ceriodaphnia affinis in acute and chronic experiments.	Hydrobiological Journal, (2007) Vol. 43, No. 6, pp. 83-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
2945	CA 8.2.5.1	Papchenkova et al.	2009	The parameters of reproduction , sizes, and activities of hydrolases in Daphnia magna straus of successive generations affected by Roundup herbicide.	Inland Water Biology, (JUL 2009) Vol. 2, No. 3, pp. 286-291	5.4.1 case b) relevant but supplementary information: The article shows significant effects compared to the control for some variables and no effects for some other, so no clear endpoint from this study can be used for the risk assessment. Results are considered as only supportive.
751	CA 8.2.6.2	Ruan et al.	2008	Effects of acute glyphosate exposure on the growth and physiology of Nostoc sphaeroides, an edible cyanobacterium of paddy rice fields.	Acta Hydrobiologica Sinica, (JUL 2008) Vol. 32, No. 4, pp. 462-468	5.4.1 case b) relevant but supplementary information: Taking into account that the sampling dates and measured variables do not comply with guidelines, the results of the study are considered only as supportive/supplementary.
698	CA 8.2.7	Nielsen et al.	2007	Direct and indirect effects of the herbicides Glyphosate , Bentazone and MCPA on eelgrass (Zostera marina).	Aquatic toxicology (Amsterdam, Netherlands), (2007 Apr 20) Vol. 82, No. 1, pp. 47-54	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
2915	CA 8.2.7 CP 10.2.1	Turgut et al.	2006	The impact of pesticides toward parrotfeather when applied at the predicted environmental concentration	Chemosphere (2006), Vol. Date 2007, 66(3), 469-473	5.4.1 case b) relevant but supplementary information: The article shows significant effects compared to the control at the only tested rate for some variables and no effects for some other, so no clear endpoint from this study can be used for the risk assessment. Results

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						are considered as only supportive.
997	CA 8.2.8	Widenfalk et al.	2008	Effects of pesticides on community composition and activity of sediment microbes -- responses at various levels of microbial community organization.	Environmental pollution (Barking, Essex : 1987), (2008 Apr) Vol. 152, No. 3, pp. 576-84	5.4.1 case b) relevant but supplementary information: Detected effects of this study are based on molecular methods that cannot be univocally integrated in the risk assessment. In addition a LOEC cannot be used in the aquatic RA. The article failed to demonstrate effects of glyphosate exposure on community-level endpoints of sediment microorganisms (bacterial activity, fungal and total microbial biomass). Results are considered as only supportive.
251	CA 8.2.8	Bonnet et al.	2007	Assessment of the potential toxicity of herbicides and their degradation products to nontarget cells using two microorganisms , the bacteria Vibrio fischeri and the ciliate Tetrahymena pyriformis.	Environmental toxicology, (2007 Feb) Vol. 22, No. 1, pp. 78-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3017	CA 8.2.8	Hernando et al.	2007	Toxicity evaluation with Vibrio fischeri test of organic chemicals used in aquaculture.	Chemosphere, Vol. 68, Issue 4, Page 724-730, Publication Year 2007	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
2504	CA 8.2.8	Pesce et al.	2009	Response of spring and summer riverine microbial communities following glyphosate exposure .	Ecotoxicology and environmental safety, (2009 Oct) Vol. 72, No. 7, pp. 1905-12	5.4.1 case b) relevant but supplementary information: Although at 10 µg/L no differences between treated and control were detected for chlorophyl content and biomass data (i.e. NOEC), the study does show effects in the community composition at that concentration for the higher temperature. In the treated microcosms, three algal genera (Asterionella, Cyclotella and Oocystis) disappeared between day 0 and day 3. Therefore, a LOEC is the only endpoint that can be established from this microcosm study and a LOEC cannot be used in the aquatic RA. Results are considered as only supportive.
875	CA 8.4	Yasmin et al.	2007	Effect of pesticides on the reproductive output of Eisenia fetida .	Bulletin of environmental contamination and toxicology, (2007 Nov) Vol. 79, No. 5, pp. 529-32	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
1140	CA 8.4.2	Ruan et al.	2009	Evaluation of Pesticide Toxicities with Differing Mechanisms Using Caenorhabditis elegans.	J. Toxicol. Environ. Health, Part A, Vol. 72, Issue 11 and 12, Page 746-751, Publication Year 2009	5.4.1 case b) relevant but supplementary information: No endpoints (NOEC, LOEC, Ecx) are provided, but some findings of the work (generation time, brood size) could serve to investigate sub-lethal effects of glyphosate on non macro-soil organisms as part of a broader discussion.
169	CA 8.5	Przybulewska	2008	An attempt to determine the	Ecol. Chem. Eng. S, Vol. 15, Issue 3,	5.4.1 case b) relevant but supplementary information: No endpoints

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
		et al.		resistance of microorganisms from triazine-contaminated soils to different herbicide groups.	Page 359-374, Publication Year 2008	are provided. Although this publication provides information about effects of high concentrations of Roundup 360 SL formulation (representative EU formulation) in soil on micro-organisms, the results are shown only in form of graphs and no detailed results are presented. Therefore the results of the study are considered only as supportive/supplementary.
3022	CP 10.2.1	Erms et al.	2009	Toxicity of glyphosate and ethoxysulfuron to the green microalgae (Scenedesmus obliquus).	Asian Journal of Chemistry (2009) , Vol. 21, No. 3, pp. 2163-2169	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
978	CP 10.5	Mijangos et al.	2009	Effects of glyphosate on rhizosphere soil microbial communities under two different plant compositions by cultivation-dependent and -independent methodologies	Soil biology and biochemistry (2009) , Vol. 41, No. 3, pp. 505-513	5.4.1 case b) relevant but supplementary information: The article still shows significant effects compared to the control at the lowest tested rate under some of the tested scenarios, so no clear endpoint from this study can be used for the risk assessment. In addition, glyphosate effect is not the only and single tested variable. Results are considered as only supportive.
3090		Curwin et al.	2007	Urinary pesticide concentrations among children, mothers and fathers living in farm and non-farm households in iowa.	The Annals of occupational hygiene, (2007 Jan) Vol. 51, No. 1, pp. 53-65	5.4.1 case b) relevant but supplementary information: Biomonitoring in Urine of farmer children, concentration in urine samples is only reported, likely not relevant or only supportive. Not relevant information for risk assessment but relevant for the dossier.

Table 26: Relevant but supplementary (category B) articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
174	Abass et al.	CA 5.8.2	2009	An evaluation of the cytochrome P450 inhibition potential of selected pesticides in human hepatic microsomes.	J. Environ. Sci. Health, Part B, Vol. 44, Issue 6, Page 553-563, Publication Year 2009	5.4.1 case b) relevant but supplementary information: The study provides only supplementary information on hepatic CYP interaction in vitro; results do not change the existing risk assessment.
1722	Accinelli et al.	CA 7.1.3.1	2006	Influence of Cry1Ac toxin on mineralization and bioavailability of glyphosate in soil .	Journal of agricultural and food chemistry (2006) , Vol. 54, No. 1, pp. 164-169	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
3028	Achiorno et al.	CA 8.2.4.2 CA 8.2.5.2	2008	Toxicity of the herbicide glyphosate to Chordodes nobilii (Gordiida, Nematomorpha).	Chemosphere, (2008 May) Vol. 71, No. 10, pp. 1816-22	5.4.1 case b) relevant but supplementary information: Data on adult mortality are not relevant, because the test was conducted with a Roundup formulation. The endpoint for larvae is based on infective capacity (of previously exposed larvae or embryos) for which significant differences compared to control were demonstrated at all tested concentrations. Therefore, a LOEC is the only endpoint that can be established from this study and a LOEC cannot be used in the aquatic RA. Results are considered as only supportive.
2671	Al-Rajab et al.	CA 7.1.3.1	2008	Sorption and leaching of 14 C-glyphosate in agricultural soils	Agronomy for Sustainable Development (Jul 2008) Vol. 28, No. 3, pp. 419-428	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. However, details in the method description are unclear (especially equilibration time). Study has some deficiencies and results are not presented in details. Additionally, no parental mass balance was established. Thus, endpoints cannot be verified.
1601	Ayoola et al.	CA 8.2.1	2008	Histopathological effects of glyphosate on juvenile African catfish (Clarias gariepinus).	American-Eurasian Journal of Agricultural and Environmental	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
					Science (2008) , Vol. 4, No. 3, pp. 362-367	individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3024	Ayoola et al.	CA 8.2.1 / CP 10.2.1	2008	Toxicity of glyphosate herbicide on Nile tilapia (Oreochromis niloticus) juvenile.	African Journal of Agricultural Research (2008) , Vol. 3, No. 12, pp. 825-834	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
297	Bolognesi et al.	CA 5.9.4.	2009	Biomonitoring of genotoxic risk in agricultural workers from five colombian regions: association to occupational exposure to glyphosate .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 986-97	5.4.1 case b) relevant but supplementary information: This article was downgraded to Category B due to its non-reliability. This publication is considered relevant for the risk assessment of glyphosate, but as supplementary material, and as not reliable. Information necessary to classify health outcome was not collected at the individual participant level; it is not possible to assess the health outcome in relation to any exposure using the results reported in this study. Additionally, exposure classification was based on self-reported glyphosate exposure, an indirect method by which to estimate exposure status of study participants. No biological evidence is provided to support exposure classification of study participants. Misclassification of either exposure, outcome, or both is possible in this study.
251	Bonnet et al.	CA 8.2.8	2007	Assessment of the potential toxicity of herbicides and their degradation products to nontarget cells using two microorganisms , the bacteria Vibrio fischeri and the ciliate Tetrahymena pyriformis.	Environmental toxicology, (2007 Feb) Vol. 22, No. 1, pp. 78-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
1000	Caceres-Jensen et al.	CA 7.1.3.1	2009	Adsorption of glyphosate on variable-charge, volcanic ash-derived soils .	Journal of environmental quality, (2009 Jul-Aug) Vol. 38, No. 4, pp. 1449-57	5.4.1 case b) relevant but supplementary information: Volcanic ash soils were investigated. These are not relevant for EU but can be relevant for Japan. The experimental setup is quite well described. The study has some deficiencies and results are not presented in detail. Thus, endpoints cannot be verified.
2270	Caldas et al.	CA 5.9.4.	2008	Poisonings with pesticides in the Federal District of Brazil.	Clin. Toxicol., Vol. 46, Issue 10, Page 1058-1063, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
108	Calvert et al.	CA 5.9.4.	2008	Acute pesticide poisoning among agricultural workers in the United States, 1998-2005.	American Journal of Industrial Medicine, (December 2008) Vol. 51, No. 12, pp. 883-898	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
1896	Candela et al.	CA 7.1.3.1	2007	Laboratory studies on glyphosate transport in soils of the Maresme area near Barcelona, Spain: Transport model parameter estimation.	Geoderma, (JUN 15 2007) Vol. 140, No. 1-2, pp. 8-16	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
3269	Carriquiriborde et al.	CA 8.2.1	2006	Ecotoxicological studies on the pejerrey (Odontesthes bonariensis, Pisces Atherinopsidae).	Biocell, (2006) Vol. 30, No. 1, pp. 97-109	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
332	Chan et al.	CA 5.8.2	2007	Cardiovascular effects of herbicides and formulated adjuvants on isolated rat aorta and heart.	Toxicol. in Vitro, Vol. 21, Issue 4, Page 595-603, Publication Year 2007	5.4.1 case b) relevant but supplementary information: The article is relevant for the risk assessment since it analyses the effects on cardiovascular cells exposed to glyphosate technical grade. Although only additional information is provided for the risk assessment.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
1238	Chen et al.	CA 7.2.1.2	2007	Fe(III)-pyruvate and Fe(III)-citrate induced photodegradation of Glyphosate in aqueous solutions	Journal of Coordination Chemistry, (2007) Vol. 60, No. 22, pp. 2431-2439	5.4.1 case b) relevant but supplementary information: The article shows that glyphosate is stable to photolysis at wavelengths ≥365 nm. According to the guideline, wavermength ≥290 nm should be investigated.
3090	Curwin et al.		2007	Urinary pesticide concentrations among children, mothers and fathers living in farm and non-farm households in iowa.	The Annals of occupational hygiene, (2007 Jan) Vol. 51, No. 1, pp. 53-65	5.4.1 case b) relevant but supplementary information: Biomonitoring in Urine of farmer children, concentration in urine samples is only reported, likely not relevant or only supportive. Not relevant information for risk assessment but relevant for the dossier.
2198	Dasgupta et al.	CA 5.9.4.	2007	Pesticide poisoning of farm workers-implications of blood test results from Vietnam.	Int. J. Hyg. Environ. Health, Vol. 210, Issue 2, Page 121-132, Publication Year 2007	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
197	Dominguez-Cortinas et al.	CA 8.2.4.1 CA 8.2.4.2	2008	Analysis of the toxicity of glyphosate and Faena (R) using the freshwater invertebrates Daphnia magna and Lecane quadridentata.	Toxicological and Environmental Chemistry, (2008) Vol. 90, No. 2, pp. 377-384	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
3022	Erms et al.	CP 10.2.1	2009	Toxicity of glyphosate and ethoxysulfuron to the green microalgae (Scenedesmus obliquus).	Asian Journal of Chemistry (2009) , Vol. 21, No. 3, pp. 2163-2169	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
1576	Farenhorst et al.	CA 7.1.3.1	2008	Herbicide sorption coefficients in relation to soil properties and terrain attributes on a cultivated prairie.	Journal of environmental quality, (2008 May-Jun) Vol. 37, No. 3, pp. 1201-8	5.4.1 case b) relevant but supplementary information: The article investigated the adsorption of glyphosate on soil. 287 surface soils (0–15 cm) collected in a 10 × 10 m grid across a heavily eroded, undulating, calcareous prairie landscape in Minnesota (U.S.). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						verified. Adsorption coefficients are only presented a mean values for respective slopes of the sampling location. The study is considered not reliable.
3130	Farenhorst et al.	CA 7.1.3.1	2009	Variations in soil properties and herbicide sorption coefficients with depth in relation to PRZM (pesticide root zone model) calculations	Geoderma (2009) , Vol. 150, No. 3-4, pp. 267-277 Source Note: 2009 May 15, v. 150, issue 3-4	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Additionally, no parental mass balance was established. Thus, endpoints cannot be verified.
377	Firth et al.	CA 5.9.4.	2007	Chemical exposure among NZ farmers.	International journal of environmental health research, (2007 Feb) Vol. 17, No. 1, pp. 33-43	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
2174	Gjettermann et al.	CA 7.1.3.1.1 CA 7.1.3.1.2	2009	Particle-facilitated pesticide leaching from differently structured soil monoliths.	Journal of environmental quality, (2009 Nov-Dec) Vol. 38, No. 6, pp. 2382-93	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described, however several details are not reported (e.g. which phase was analysed). Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Additionally, no parental mass balance was established.
2026	Grundmann et al.	CA 7.1.4.2	2008	Mineralization and Transfer Processes of 14C-labeled Pesticides in Outdoor Lysimeters	Water, air and soil pollution. Focus (2008) , Vol. 8, No. 2, pp. 177-185	5.4.1 case b) relevant but supplementary information: The study has several deficinecies. Furthermore, experimental set-up and analytical results are not described in detail.
3017	Hernando et al.	CA 8.2.8	2007	Toxicity evaluation with Vibrio fischeri test of organic chemicals used in aquaculture.	Chemosphere, Vol. 68, Issue 4, Page 724-730, Publication Year 2007	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
155	Hokanson et al.	CA 5.8.3	2007	Alteration of estrogen-regulated gene expression in human cells induced by the agricultural and horticultural herbicide glyphosate .	Human and experimental toxicology, (2007 Sep) Vol. 26, No. 9, pp. 747-52	5.4.1 case b) relevant but supplementary information: The toxicity of glyphosate poduct (15%) was examined as a function of its capacity to alter gene expression (29 up and down regulated genes) in the presence or absence of estrogen. Temporal altered gene expression is not a biomarker for toxicity, but rather, may be within the range of normal biological responses of homeostasis. In vitro cytotoxicity of surfactants, however, is a significant confounder in data interpretation. Data do not reflect real in vivo exposure situations, and therefore only provides supporting information for human risk assessment purposes.
2208	Horiuchi et al.	CA 5.9.4.	2008	Pesticide-related dermatitis in Saku district, Japan, 1975-2000.	International journal of occupational and environmental health, (2008 Jan-Mar) Vol. 14, No. 1, pp. 25-34	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
598	Hultberg et al.	CA 5.8.2	2007	Cysteine turnover in human cell lines is influenced by glyphosate .	Environmental Toxicology and Pharmacology, (JUL 2007) Vol. 24, No. 1, pp. 19-22	5.4.1 case b) relevant but supplementary information: The article is providing only supplementary information for the risk assessment regarding the effect of Glyphosate to intra and extra cellular cysteine and glutathione levels.
3128	Jacobsen et al.	CA 7.1.3.1	2008	Variation of MCPA, metribuzine, methyltriazine-amine and glyphosate degradation, sorption, mineralization and leaching in different soil horizons.	Environ. Pollut. (Oxford, U. K.), Vol. 156, Issue 3, Page 794-802, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Experiments were performed at 10°C and only one concentration was used. Additionally, no parental mass balance was established.
1010	Laitinen et al.	CA 7.1.3.1	2008	Effects of soil phosphorus status on environmental risk assessment of glyphosate and glufosinate-ammonium.	J. Environ. Qual., Volume 37, Issue 3, Page 830-838, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described, however several details are not reported (e.g. which phase was analysed). Study has some deficiencies and results are not presented in details. Thus, endpoints

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						cannot be verified. Additionally, no parental mass balance was established.
1442	Laitinen et al.	CA 7.1.4.3	2009	Glyphosate and phosphorus leaching and residues in boreal sandy soil	PLANT AND SOIL, (OCT 2009) Vol. 323, No. 1-2, Sp. iss. SI, pp. 267-283	5.4.1 case b) relevant but supplementary information: The study does not represent worst case condition. The study period was dry in the whole Southern and Central Finland causing exceptionally low groundwater table levels and droughts in spring 2003. During the whole study the total precipitation was 867 mm in the experimental field, representing 80% of the long-term precipitation. Furthermore, the leaching field was situated in an intensively cultivated region, where the use of glyphosate is common.
623	Mamy et al.	CA 7.1.2 CA 7.1.3.1	2007	Desorption and time-dependent sorption of herbicides in soils	European journal of soil science (2007) , Vol. 58, No. 1, pp. 174-187	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method are quite well described. The study has some deficiencies and results are not presented in detail. Thus, endpoints cannot be verified.
1336	Manas et al.	CA 5.8.1	2009	Genotoxicity of AMPA, the environmental metabolite of glyphosate , assessed by the Comet assay and cytogenetic tests.	Ecotoxicology and environmental safety, (2009 Mar) Vol. 72, No. 3, pp. 834-7	5.4.1 case b) relevant but supplementary information: The publication is providing genotoxcity information on AMPA via in vitro Comet assay in Hep-2, chromosome aberration test in human lymphocytes and in vivo micronucleus test in mice. The article was downgraded to Category B due to its non-reliability.
1296	Mclaughlin et al.	CA 5.8.2	2008	Functional expression and comparative characterization of nine murine cytochromes P 450 by fluorescent inhibition screening	Drug Metabolism and Disposition, (2008) Vol. 36, No. 7, pp. 1322-1331	5.4.1 case b) relevant but supplementary information: The data presented in this study provide only supportive information for the risk asessment regarding potential interaction of glyphosate with mouse and human P450s involved in xenobiotic metabolism.
1119	Melnichuk et al.	CA 8.2.4.1 CA 8.2.4.2	2007	Estimation of toxicity of glyphosate - based herbicides by biotesting method using Cladocera.	Hydrobiological Journal, (2007) Vol. 43, No. 3, pp. 80-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
939	Melnichuk et al.	CA 8.2.4.2 CA 8.2.5.2	2007	Effects of Fakel herbicide on vital activity of Ceriodaphnia affinis in acute and chronic experiments.	Hydrobiological Journal, (2007) Vol. 43, No. 6, pp. 83-91	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
978	Mijangos et al.	CP 10.5	2009	Effects of glyphosate on rhizosphere soil microbial communities under two different plant compositions by cultivation-dependent and -independent methodologies	Soil biology and biochemistry (2009) , Vol. 41, No. 3, pp. 505-513	5.4.1 case b) relevant but supplementary information: The article still shows significant effects compared to the control at the lowest tested rate under some of the tested scenarios, so no clear endpoint from this study can be used for the risk assessment. In addition, glyphosate effect is not the only and single tested variable. Results are considered as only supportive.
136	Naidoo et al.	CA 5.9.4.	2008	Agricultural activities, pesticide use and occupational hazards among women working in small scale farming in Northern KwaZulu-Natal, South Africa.	Int. J. Occup. Environ. Health, Vol. 14, Issue 3, Page 218-224, Publication Year 2008	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
698	Nielsen et al.	CA 8.2.7	2007	Direct and indirect effects of the herbicides Glyphosate , Bentazone and MCPA on eelgrass (Zostera marina).	Aquatic toxicology (Amsterdam, Netherlands), (2007 Apr 20) Vol. 82, No. 1, pp. 47-54	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
2945	Papchenkova et al.	CA 8.2.5.1	2009	The parameters of reproduction , sizes, and activities of hydrolases in Daphnia magna straus of successive generations affected by Roundup herbicide.	Inland Water Biology, (JUL 2009) Vol. 2, No. 3, pp. 286-291	5.4.1 case b) relevant but supplementary information: The article shows significant effects compared to the control for some variables and no effects for some other, so no clear

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						endpoint from this study can be used for the risk assessment. Results are considered as only supportive.
2504	Pesce et al.	CA 8.2.8	2009	Response of spring and summer riverine microbial communities following glyphosate exposure .	Ecotoxicology and environmental safety, (2009 Oct) Vol. 72, No. 7, pp. 1905-12	5.4.1 case b) relevant but supplementary information: Although at 10 µg/L no differences between treated and control were detected for chlorophyl content and biomass data (i.e. NOEC), the study does show effects in the community composition at that concentration for the higher temperature. In the treated microcosms, three algal genera (Asterionella, Cyclotella and Oocystis) disappeared between day 0 and day 3. Therefore, a LOEC is the only endpoint that can be established from this microcosm study and a LOEC cannot be used in the aquatic RA. Results are considered as only supportive.
644	Popp et al.	CA 7.5	2008	Determination of glyphosate and AMPA in surface and waste water using high-performance ion chromatography coupled to inductively coupled plasma dynamic reaction cell mass spectrometry (HPIC-ICP-DRC-MS)	Analytical and bioanalytical chemistry (2008) , Vol. 391, No. 2, pp. 695-699	5.4.1 case b) relevant but supplementary information: Details on sampling like exact location, timing, duration and sampling method are not available. Therefore, results cannot be related to the application schedule of glyphosate. Furthermore, available information on the analytical method and its validation does not allow for a full assessment of its acceptability.
169	Przybulewska et al.	CA 8.5	2008	An attempt to determine the resistance of microorganisms from triazine-contaminated soils to different herbicide groups.	Ecol. Chem. Eng. S, Vol. 15, Issue 3, Page 359-374, Publication Year 2008	5.4.1 case b) relevant but supplementary information: No endpoints are provided. Although this publication provides information about effects of high concentrations of Roundup 360 SL formulation (representative EU formulation) in soil on micro-organisms, the results are shown only in form of graphs and no detailed results are presented. Therefore the results of the study are considered only as supportive/supplementary.
996	Quassinti et al.	CA 8.1.5	2009	Effects of paraquat and glyphosate on steroidogenesis in gonads of the frog Rana esculenta in vitro	Pesticide biochemistry and physiology (2009) , Vol. 93, No. 2, pp. 91-95	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						can only be considered as supplementary information that cannot alter the existing risk assessment parameters.
243	Radio et al.	CA 5.7	2008	Assessment of Chemical Effects on Neurite Outgrowth in PC12 cells Using High Content Screening.	Toxicol. Sci., Vol. 105, Issue 1, Page 106-118, Publication Year 2008	5.4.1 case b) relevant but supplementary information: The data presented in this study provide only supportive information for the risk asessment regarding effect of glyphosate on outgrowth of neurites in differentiated Neuroscreen-1 cells.
3281	Recena et al.	CA 5.9.4.	2006	Pesticides exposure in Culturama, Brazil-Knowledge, attitudes, and practices	Environmental Research, (2006) Vol. 102, No. 2, pp. 230-236	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
23	Relyea	CA 8.1.4 CA 8.2.8	2009	A cocktail of contaminants: how mixtures of pesticides at low concentrations affect aquatic communities .	Oecologia, (2009 Mar) Vol. 159, No. 2, pp. 363-76	5.4.1 case b) relevant but supplementary information: Provides information on the effects of glyphosate on phytoplankton, zooplankton and periphyton and larval development of ambphibians but no risk assessment relevant endpoints are presented.
751	Ruan et al.	CA 8.2.6.2	2008	Effects of acute glyphosate exposure on the growth and physiology of Nostoc sphaeroides, an edible cyanobacterium of paddy rice fields.	Acta Hydrobiologica Sinica, (JUL 2008) Vol. 32, No. 4, pp. 462-468	5.4.1 case b) relevant but supplementary information: Taking into account that the sampling dates and measured variables do not comply with guidelines, the results of the study are considered only as supportive/supplementary.
1140	Ruan et al.	CA 8.4.2	2009	Evaluation of Pesticide Toxicities with Differing Mechanisms Using Caenorhabditis elegans.	J. Toxicol. Environ. Health, Part A, Vol. 72, Issue 11 and 12, Page 746-751, Publication Year 2009	5.4.1 case b) relevant but supplementary information: No endpoints (NOEC, LOEC, Ecx) are provided, but some findings of the work (generation time, brood size) could serve to investigate sub-lethal effects of glyphosate on non macro-soil organisms as part of a broader discussion.
1006	Saka et al.	CA 6.5.3	2008	Effects of processing and cooking on the levels of pesticide residues in soybean samples.	Shokuhin Eiseigaku Zasshi, (JUN 2008) Vol. 49, No. 3, pp. 160-167.	5.4.1 case b) relevant but supplementary information: It provides the information on Pfs that can be used supportive of setting the MRLs. However, in the current Japanese MRL setting system, the MRL for soybean is set for RAC and Pfs for soy bean products are not reflected into the dietary risk assessment.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
2416	Sanin et al.	CA 5.9.4.	2009	Regional differences in time to pregnancy among fertile women from five Colombian regions with different use of glyphosate .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 949-60	5.4.1 case b) relevant but supplementary information: This article was downgraded to Category B due to its non-reliability. This publication is considered relevant for the risk assessment of glyphosate, but as supplementary material, and as not reliable. Information necessary to classify health outcome was not collected at the individual participant level; no biological evidence is provided to support exposure classification of study participants. Misclassification of exposure is possible in this study. It is not possible to assess the health outcome in relation to exposure using the results reported in this study.
1257	Settimi et al.	CA 5.9.4.	2008	Findings from the Italian Program for Surveillance of Acute Pesticide-related Illness, 2005	Clinical Toxicology [Clin. Toxicol.], (20080600) vol. 46, no. 5, p. 388	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome
1231	Simonsen et al.	CA 7.1.2	2008	Fate and availability of glyphosate and AMPA in agricultural soil .	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2008 Jun) Vol. 43, No. 5, pp. 365-75	5.4.1 case b) relevant but supplementary information: The experimental setup and analytical method are quite well described. The study has some deficiencies and results are not presented in details. Thus, endpoints cannot be verified. Tested soil was not glyphosate free.
2669	Sorensen et al.	CA 7.1.3.1	2006	Sorption , desorption and mineralisation of the herbicides glyphosate and MCPA in samples from two Danish soil and subsurface profiles.	Environmental pollution (2006) , Vol. 141, No. 1, pp. 184-194	5.4.1 case b) relevant but supplementary information: Experimental setup and analytical method quite well described. Study has some deficiencies and results are not presented in details. One soil site was heavily used for agriculture in the past - the usage of glyphosate is likely. Thus, endpoints cannot be verified. Experiments were performed at 10°C. Additionally, no parental mass balance was established.
2418	Sudakin et al.	CA 5.9.4.	2009	Regional variation in the severity of pesticide exposure outcomes: applications of geographic information systems and spatial scan statistics	Clinical Toxicology, (2009) Vol. 47, No. 3, pp. 248-252	5.4.1 case b) relevant but supplementary information: Publication does not report any estimate of association between glyphosate exposure and any health outcome

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
2915	Turgut	CA 8.2.7 CP 10.2.1	2006	The impact of pesticides toward parrotfeather when applied at the predicted environmental concentration	Chemosphere (2006), Vol. Date 2007, 66(3), 469-473	5.4.1 case b) relevant but supplementary information: The article shows significant effects compared to the control at the only tested rate for some variables and no effects for some other, so no clear endpoint from this study can be used for the risk assessment. Results are considered as only supportive.
997	Widenfalk et al.	CA 8.2.8	2008	Effects of pesticides on community composition and activity of sediment microbes --responses at various levels of microbial community organization.	Environmental pollution (Barking, Essex : 1987), (2008 Apr) Vol. 152, No. 3, pp. 576-84	5.4.1 case b) relevant but supplementary information: Detected effects of this study are based on molecular methods that cannot be univocally integrated in the risk assessment. In addition a LOEC cannot be used in the aquatic RA. The article failed to demonstrate effects of glyphosate exposure on community-level endpoints of sediment microorganisms (bacterial activity, fungal and total microbial biomass). Results are considered as only supportive.
875	Yasmin et al.	CA 8.4	2007	Effect of pesticides on the reproductive output of Eisenia fetida .	Bulletin of environmental contamination and toxicology, (2007 Nov) Vol. 79, No. 5, pp. 529-32	5.4.1 case b) relevant but supplementary information: Although the study is relevant for the data requirement, important methodological information is missing (analytical verification of concentrations, test item identification, test individuals and/or substrate source, etc.), so that the results can only be considered as supplementary information that cannot alter the existing risk assessment parameters.

Table 27: Articles of unclear relevance (category C) after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
601	CA 5.4.1	Sivikova et al.	2006	Cytogenetic effect of technical glyphosate on cultivated bovine peripheral lymphocytes.	International Journal of Hygiene and Environmental Health (2006) , Vol. 209, No. 1, pp. 15-20	5.4.1 case c) unclear relevance for the following reason: The paper is about an in vitro CA and SCE study on bovine lymphocytes exposed to a glyphosate formulation for 2h with metabolic activation and 24h and 48 h without metabolic activation. A glyphosate product (glyphosate , approximate 62% by weight) with 3
2194	CA 5.9.1	Curwin et al.	2007	Pesticide dose estimates for children of Iowa farmers and non-farmers.	Environmental research, (2007 Nov) Vol. 105, No. 3, pp. 307-15	5.4.1 case c) unclear relevance for the following reason: The study is providing only supplementary information for the risk assessment regarding biomonitoring data (urine) for children of farmers and non-farmers.
1545	CP 7.1.7	Malatesta et al.	2008	Hepatoma tissue culture (HTC) cells as a model for investigating the effects of low concentrations of herbicide on cell structure and function.	Toxicology in vitro : an international journal published in association with BIBRA, (2008 Dec) Vol. 22, No. 8, pp. 1853-60	5.4.1 case c) unclear relevance for the following reason: In vitro study with Glyphosate formulation of unknown composition investigating the effects on modifications in mitochondrial functions and transcription/splicing pathways in hepatocytes. Pure active substance was not tested.
917	CA 8.3.2	Addison et al.	2006	Effect of various pesticides on the non-target species Microctonus hyperodae, a biological control agent of Listronotus bonariensis.	Entomologia Experimentalis et Applicata (2006) Vol. 119, No. 1, pp. 71-79	5.4.1 case c) unclear relevance for the following reason: Study provides information on effects of a Roundup formulation on the parasitoid wasp Microtonus hyperodae. As the exposure situation in the test (exposure via shaking in test solution) is not comparable to the field situation (overspray or exposure to residues) and study condtions are not mentioned the relevance of the study cannot be clearly determined.
430	CP 7.1.7	Dimitrov et al.	2006	Comparative genotoxicity of the herbicides Roundup, Stomp and Reglone in plant and mammalian test systems.	Mutagenesis, (2006 Nov) Vol. 21, No. 6, pp. 375-82. Electronic Publication Date: 23 Sep 2006	5.4.1 case c) unclear relevance for the following reason: The study is providing only supplementary information for the risk assessment. Furthermore, no information on Roundup formulation (batch, adjuvants, expiration date, storage, analytics, purchaser) are given. There are uncertainties whether the test concentrations are in physiologically acceptable range (< 1mM) and the active ingredient content in oral doses is unclear.
1335	CP 7.1.7	Heydens et al.	2008	Genotoxic potential of glyphosate formulations: mode - of - action investigations.	Journal of agricultural and food chemistry, (2008 Feb 27) Vol. 56, No. 4, pp. 1517-23	5.4.1 case c) unclear relevance for the following reason: Genotox data on non-representative glyphosate formulation of unknown composition; relevance uncertain; Publication, no guideline/GLP study/mode of action study: clarifying contradictory results from other genotoxicity studies

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
1182	CP 7.1.7	Holeckova et al.	2006	Evaluation of the in vitro effect of glyphosate -based herbicide on bovine lymphocytes using chromosome painting.	Bulletin of the Veterinary Institute in Puawy (2006) , Vol. 50, No. 4, pp. 533-536	5.4.1 case c) unclear relevance for the following reason: The induction of bovine chromosome 1 aberrations was investigated in cultivated peripheral lymphocytes of cattle after an application of a glyphosate-based herbicide formulation. A glyphosate product (glyphosate , approximate 62% by weight) with 38% inert

Table 28: Articles of unclear relevance (category C) after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
917	Addison et al.	CA 8.3.2	2006	Effect of various pesticides on the non-target species Microctonus hyperodae, a biological control agent of Listronotus bonariensis.	Entomologia Experimentalis et Applicata (2006) Vol. 119, No. 1, pp. 71-79	5.4.1 case c) unclear relevance for the following reason: Study provides information on effects of a Roundup formulation on the parasitoid wasp Microtonus hyperodae. As the exposure situation in the test (exposure via shaking in test solution) is not comparable to the field situation (overspray or exposure to residues) and study condtions are not mentioned the relevance of the study cannot be clearly determined.
2194	Curwin et al.	CA 5.9.1	2007	Pesticide dose estimates for children of Iowa farmers and non-farmers.	Environmental research, (2007 Nov) Vol. 105, No. 3, pp. 307-15	5.4.1 case c) unclear relevance for the following reason: The study is providing only supplementary information for the risk assessment regarding biomonitoring data (urine) for children of farmers and non-farmers.
430	Dimitrov et al.	CP 7.1.7	2006	Comparative genotoxicity of the herbicides Roundup, Stomp and Reglone in plant and mammalian test systems.	Mutagenesis, (2006 Nov) Vol. 21, No. 6, pp. 375-82. Electronic Publication Date: 23 Sep 2006	5.4.1 case c) unclear relevance for the following reason: The study is providing only supplementary information for the risk assessment. Furthermore, no information on Roundup formulation (batch, adjuvants, expiration date, storage, analytics, purchaser) are given. There are uncertainties whether the test concentrations are in physiologically acceptable range (< 1mM) and the active ingredient content in oral doses is unclear.
1335	Heydens et al.	CP 7.1.7	2008	Genotoxic potential of glyphosate formulations: mode - of - action investigations.	Journal of agricultural and food chemistry, (2008 Feb 27) Vol. 56, No. 4, pp. 1517-23	5.4.1 case c) unclear relevance for the following reason: Genotox data on non-representative glyphosate formulation of unknown composition; relevance uncertain; Publication, no guideline/GLP study/mode of action study: clarifying contradictory results from other genotoxicity studies
1182	Holeckova et al.	CP 7.1.7	2006	Evaluation of the in vitro effect of glyphosate -based herbicide on bovine lymphocytes using chromosome painting.	Bulletin of the Veterinary Institute in Puawy (2006) , Vol. 50, No. 4, pp. 533-536	5.4.1 case c) unclear relevance for the following reason: The induction of bovine chromosome 1 aberrations was investigated in cultivated peripheral lymphocytes of cattle after an application of a glyphosate-based herbicide formulation. A glyphosate product (glyphosate , approximate 62% by weight) with 38% inert
1545	Malatesta et al.	CA 7.1.7	2008	Hepatoma tissue culture (HTC) cells as a model for investigating the effects of low concentrations of herbicide on cell structure and function.	Toxicology in vitro : an international journal published in association with BIBRA, (2008 Dec) Vol. 22, No. 8, pp. 1853-60	5.4.1 case c) unclear relevance for the following reason: In vitro study with Glyphosate formulation of unknown composition investigating the effects on modifications in mitochondrial functions and transcription/splicing pathways in hepatocytes. Pure active substance was not tested.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
601	Sivikova et al.	CA 5.4.1	2006	Cytogenetic effect of technical glyphosate on cultivated bovine peripheral lymphocytes.	International Journal of Hygiene and Environmental Health (2006) , Vol. 209, No. 1, pp. 15-20	5.4.1 case c) unclear relevance for the following reason: The paper is about an in vitro CA and SCE study on bovine lymphocytes exposed to a glyphosate formulation for 2h with metabolic activation and 24h and 48 h without metabolic activation. A glyphosate product (glyphosate , approximate 62% by weight) with 3

Table 29: Articles excluded after detailed assessment (i.e. not relevant): sorted by technical section (and by author)

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
2690		Hunter	2008	Spare part nightmare	Farmers Weekly. Vol. 149, no. 8, pp. 59-59. 22 Aug. 2008	Farmers Weekly is not a peer-reviewed journal. No abstract nor full text available. According to the title, it is related to spare parts, not relevant for the risk assessment.
1914	Ecotoxicology (incl. pollen/nectar residue)	Aliferis et al.	2009	Lemna minor L. as a model organism for ecotoxicological studies performing 1H NMR fingerprinting.	Chemosphere, (2009 Aug) Vol. 76, No. 7, pp. 967-73	This study presents findings regarding metabolics and therefore only based on cellular and molecular level that cannot be related to the risk assessment.
253	Ecotoxicology (incl. pollen/nectar residue)	Amoros et al.	2007	Assessment of toxicity of a glyphosate -based formulation using bacterial systems in lake water .	Chemosphere, (2007 May) Vol. 67, No. 11, pp. 2221-8	The Roundup formulation used in the study contains POEA surfactant which is permitted in formulated herbicidal products in the EU / Japan. Analytical verifications of the test item concentrations were conducted but no detailed results were reported. Results are reported in diagrams, but no numerical results are presented for the treatments
69	Ecotoxicology (incl. pollen/nectar residue)	Bautista	2007	A summary of acute risk of four common herbicides to birds and mammals .	U S Forest Service Pacific Northwest Research Station General Technical Report PNW-GTR, (JUN 2007) No. 694, pp. 77-82	In this publication risk assessments for birds and mammals are conducted on the basis of available endpoints from other publications. No new data for the RA is provided.
3020	Ecotoxicology (incl. pollen/nectar residue)	Bernal et al.	2009	Toxicity of formulated glyphosate (glyphos) and cosmo-flux to larval Colombian frogs 1. Laboratory acute toxicity.	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 961-5	In this article the observations were caused by a mixture of compounds (a mixture of formulated glyphosate -Glyphos- and the adjuvant Cosmo-Flux) and thus not attributable to glyphosate alone (e.g. mixture toxicity). In addition, the tested glyphosate formulation is not the representative formulation for the AIR5 dossier and thus not relevant to the EU /Japan glyphosate renewal. It probably contains the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. All tested individuals were taken from natural sources with an unknown history of previous chemical applications.
3021	Ecotoxicology (incl. pollen/nectar residue)	Bernal et al.	2009	Toxicity of formulated glyphosate (glyphos) and cosmo-flux to larval and juvenile colombian frogs 2. Field and laboratory microcosm acute toxicity .	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 966-73	In this article the observations were caused by a mixture of compounds (a mixture of formulated glyphosate -Glyphos- and the adjuvant Cosmo-Flux) and thus not attributable to glyphosate alone (e.g. mixture toxicity). In addition, the tested glyphosate formulation is not the representative formulation for the AIR5 dossier and thus not relevant to the EU /Japan glyphosate renewal. It probably contains the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. All tested individuals were taken from natural sources with an unknown history of previous chemical applications. Furthermore, this field study does not deal with EU / Japan representative uses / conditions (e.g. field locations, water properties, specific climatic conditions, etc.).

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
2205	Ecotoxicology (incl. pollen/nectar residue)	Brausch et al.	2006	Pesticide usage on the Southern High Plains and acute toxicity of four chemicals to the fairy shrimp Thamnocephalus platyurus (crustacea: anostraca).	Tex. J. Sci., Vol. 58, Issue 4, Page 309-324, Publication Year 2006	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
999	Ecotoxicology (incl. pollen/nectar residue)	Bueno et al.	2008	Effects of pesticides used in soybean crops to the egg parasitoid Trichogramma pretiosum.	Ciencia Rural, (SEP 2008) Vol. 38, No. 6, pp. 1495-1503	This publication is dealing with formulations (Roundup Ready®, Roundup Transorb®, Roundup Original®, Gliz®) that are not the representative formulations for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. They probably contain the surfactant POEA or a similar one, which is not permitted in formulated herbicidal products in the EU / Japan?.
1646	Ecotoxicology (incl. pollen/nectar residue)	Bushaiba et al.	2006	Impact of chemical pesticides on survival and feeding rate of the woodlouse Porcellio scaber (Isopoda, Oniscidea) in Benghazi, Libya.	Jordan Journal of Applied Science (Natural Sciences) (2006) , Vol. 8, No. 2, pp. 43-50	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan.
775	Ecotoxicology (incl. pollen/nectar residue)	Casabe et al.	2007	Ecotoxicological assessment of the effects of glyphosate and chlorpyrifos in an Argentine soya field	Journal of soils and sediments (2007) , Vol. 7, No. 4, pp. 232-239	The field phase of this publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in soya fields under open-air conditions in Argentina). In addition, the study was conducted with a Roundup formulation (Roundup FG), probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
1334	Ecotoxicology (incl. pollen/nectar residue)	Cavalcante et al.	2008	Genotoxic effects of Roundup on the fish Prochilodus lineatus.	Mutation research, (2008 Aug-Sep) Vol. 655, No. 1-2, pp. 41-6.	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the findings are only based on cellular and molecular level that cannot be related to the risk assessment.
631	Ecotoxicology (incl. pollen/nectar residue)	Cavas et al.	2007	Detection of cytogenetic and DNA damage in peripheral erythrocytes of goldfish (Carassius auratus) exposed to a glyphosate formulation using the micronucleus test and the comet assay.	Mutagenesis, (2007 Jul) Vol. 22, No. 4, pp. 263-8	This publication is dealing with a Roundup formulation containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the findings are based on cellular and molecular level (analysis of micronuclei and other nuclear abnormalities and a comet assay) that cannot be related to the risk assessment.
2944	Ecotoxicology (incl. pollen/nectar residue)	Cedergreen et al.	2006	The occurrence of hormesis in plants and algae .	Dose-response : a publication of International Hormesis Society, (2006 Oct 17) Vol. 5, No. 2, pp. 150-62	In this publication the frequency, magnitude and dose/concentration range of hormesis of one algal and three plant species after expsoure to glyphosate and other pesticides was investigated. Therefore available dose-response curves from other publications were taken into

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
						account. As no new experimental data was generated and the findings cannot be related to the risk assessment this publication is regarded to be not relevant.
2439	Ecotoxicology (incl. pollen/nectar residue)	Cedergreen et al.	2007	Reproducibility of binary-mixture toxicity studies.	Environmental Toxicology and Chemistry (2007) , Vol. 26, No. 1, pp. 149-156	The observations presented in this study were caused by mixture of different herbicides and thus not attributable to glyphosate itself (e.g. mixture toxicity). Glyphosate alone data (EC50) were also calculated for Lemna minor, but no data/values were given, just graphical representations. For Tripleurospernum indorum, a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan, was used. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
1872	Ecotoxicology (incl. pollen/nectar residue)	Cedergreen et al.	2007	Is mixture toxicity measured on a biomarker indicative of what happens on a population level? A study with Lemna minor.	Ecotoxicology and Environmental Safety, (JUL 2007) Vol. 67, No. 3, pp. 323-332	The observations presented in this study were caused by mixture of different herbicides and thus not attributable to glyphosate itself (e.g. mixture toxicity). Glyphosate alone data were calculated (mean growth and mean pigment EC50 for Lemna minor), but no data/values were given, just graphical representations.
567	Ecotoxicology (incl. pollen/nectar residue)	Cericato et al.	2008	Cortisol response to acute stress in jundia Rhamdia quelen acutely exposed to sub-lethal concentrations of agrichemicals	Comparative Biochemistry and Physiology, Part C: Toxicology and Pharmacology (2008), 148C(3), 281-286	This publication is dealing with a Roundup formulation containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the findings are based on molecular level (cortisol in plasma) that cannot be related to the risk assessment.
1785	Ecotoxicology (incl. pollen/nectar residue)	Chattopadhyay et al.	2007	Influences of environmental factors and antidote addition on glyphosate toxicity to freshwater fish , Labeo rohita (Hamilton)	Chemistry and Ecology [Chem. Ecol.]. Vol. 23, no. 4, pp. 279-287. Aug 2007	This publication deals with the Glycel® formulation, containing ethoxylated tallow alkyl amines surfactant, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, most observations are addressing the effects of a mixture of potentially causal factors (pH, calcium, salinity) and thus not fully attributable to glyphosate itself. The exposure time of the fish to the fresh or aged residues of glyphosate in water is not given and the applied concentration is not clear (12.3 L a.i/ha/m).
99	Ecotoxicology (incl. pollen/nectar residue)	Comstock et al.	2007	Actue toxic effects of round-up herbicide on wood frog tadpoles (Rana sylvatica).	Journal of Freshwater Ecology, (DEC 2007) Vol. 22, No. 4, pp. 705-708	The Roundup formulation used in the study contains POEA surfactant which is permitted in formulated herbicidal products in the EU / Japan. No analytical verifications of the test item concentrations in the test media were conducted. No replicates were used for the study design and study conditions are not described (pH, temperature, oxygen content, water quality parameters, feeding)
2158	Ecotoxicology (incl. pollen/nectar residue)	Costa et al.	2008	Oxidative stress biomarkers and heart function in bullfrog tadpoles	Ecotoxicology (London, England), (2008 Apr) Vol. 17, No. 3, pp.	This publication deals with a Roundup formulation, containing the surfactant POEA (or any similar), which is

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
				exposed to Roundup Original.	153-63	not permitted in formulated herbicidal products in the EU / Japan.
3019	Ecotoxicology (incl. pollen/nectar residue)	Dinehart et al.	2009	Toxicity of a glufosinate- and several glyphosate-based herbicides to juvenile amphibians from the Southern High Plains, USA.	Sci. Total Environ., Vol. 407, Issue 3, Page 1065-1071, Publication Year 2009	This publication is dealing with Roundup formulations containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan or in a mixture together with pelargonic acid. These are not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the individuals were taken from natural sources and the specific exposure history of the populations from which animals used in this study were drawn is unknown. These amphibian populations likely experienced previous pesticide exposure because they were inhabiting wetlands surrounded by agriculture.
904	Ecotoxicology (incl. pollen/nectar residue)	Elandalloussi et al.	2008	Effect of the herbicide Roundup on Perkinsus olseni in vitro proliferation and in vivo survival when infecting a permissive host, the clam Ruditapes decussatus.	Bulletin of environmental contamination and toxicology, (2008 Jun) Vol. 80, No. 6, pp. 512-5	In this study the active substance glyphosate and a Roundup formulation containing POEA surfactant is tested. The study results determined for the active substance glyphosate are very limited, i.e. for the parasitic protozoa Perkinsus olseni the in vitro inhibition of growth was tested and one IC50 value without confidence intervals is presented. For the Roundup formulation and the active substance glyphosate no analytical verifcations of test item concentrations were conducted. As the surfactant POEA is not permitted in formulated products in the EU/Japan the determined study results for the Roundup-formulation are not regarded relevant. The study results for the active substance glyphosate are also not regarded relevant, as no analytical verification of the test concentrations were conducted, the results are very limited and the test species and test design is not regarded adequate to assess ecotoxicological relevant endpoints for the risk assessment.
1600	Ecotoxicology (incl. pollen/nectar residue)	El-Shenawy et al.	2009	Histopathologic Biomarker Response of Clam, Ruditapes decussates, to Organophosphorous Pesticides Reldan and Roundup: A Laboratory Study.	Ocean Science Journal, (MAR 2009) Vol. 44, No. 1, pp. 27-34	This publication does not provide any numerical/graphical result, just digital images of histopathological changes without any measure of these changes and no relation with related chronic toxicological effects. In addition, this publication is dealing with a Roundup formulation most probably containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan.
2627	Ecotoxicology (incl. pollen/nectar residue)	Fell et al.	2006	Short-term effects on macroinvertebrates and fishes of herbiciding and mowing Phragmites australis-dominated tidal marsh.	Northeastern Naturalist, (2006) Vol. 13, No. 2, pp. 191-212	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the field survey was conducted in 50 ha of marshland in US). In addition, it deals with a Rodeo formulation in combination with the aquatic surfactant Chem Surf. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. The observations are also caused by a mixture of potentially causal factors and thus not only attributable to glyphosate.

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
342	Ecotoxicology (incl. pollen/nectar residue)	Glazko et al.	2006	Change in the enzyme spectra of soil microorganisms Micrococcus luteus CCM 248 and Stenotrophomonas maltophilia UKM V-257 under the effect of certain pesticides.	Russian Agricultural Sciences (2006) , No. 5, pp. 8-12, translated from Doklady Rossiiskoi Akademii Selskokhozyaistvennykh Nauk (2006) No. 3, 27-30 (Ru)	In this literature article the effect of Roundup and other pesticides on the synthesis of enzymes in M. luteus CCM 248 and S. maltophilia UKM V-257 is examined. As the findings are based on molecular level, they cannot be related to the risk assessment.
104	Ecotoxicology (incl. pollen/nectar residue)	Glusczak et al.	2007	Acute effects of glyphosate herbicide on metabolic and enzymatic parameters of silver catfish (Rhamdia quelen).	Comparative biochemistry and physiology. Toxicology and pharmacology : CBP, (2007 Nov) Vol. 146, No. 4, pp. 519-24	The Roundup formulation used in the study contains POEA surfactant which is permitted in formulated herbicidal products in the EU/Japan. In addition in the study the effects of Roundup on metabolic and enzymatic parameters of silver catfish were assessed. As the findings are only based on molecular level they cannot be related to the risk assessment.
832	Ecotoxicology (incl. pollen/nectar residue)	Glusczak et al.	2006	Effect of glyphosate herbicide on acetylcholinesterase activity and metabolic and hematological parameters in piava (Leporinus obtusidens).	Ecotoxicology and Environmental Safety, (OCT 2006) Vol. 65, No. 2, pp. 237-241	In this literature article the effects of Roundup on acethycholinesterase and hematological parameters in Leporinus obtusidens were assessed. As the findings are only based on molecular level they cannot be related to the risk assessment.
2996	Ecotoxicology (incl. pollen/nectar residue)	Guilherme et al.	2009	Tissue specific DNA damage in the European eel (Anguilla anguilla) following a short-term exposure to a glyphosate -based herbicide	Toxicology Letters [Toxicol. Lett.]. Vol. 189, S212 p. 13 Sep 2009	This abstract refers to the 46th Congress of the European Societies of Toxicology. Tissue specific DNA damage in the European eel following a short-term exposure to a glyphosate based herbicide is the topic under investigation. As no detailed information is provided and the findings are only based on molecular level, they cannot be related to the risk assessment.
2969	Ecotoxicology (incl. pollen/nectar residue)	Guiseppe	2006	The use of glyphosate herbicides in managed forest ecosystems and their effects on non-target organisms with particular reference to ants as bioindicators	(2006) , Electronic Series Title: Technical bulletin (Maine Agricultural and Forest Experiment Station) ; 192	Scientific review of existing literature.
348	Ecotoxicology (incl. pollen/nectar residue)	Gupta et al.	2009	Changes in microbial biomass and phosphatase activity exposed to 2,4-D and glyphosate	Journal of Environmental Research and Development (2009), 3(3), 663-669	The study focuses on the effects of glyphosate on the phosphatase enzyme, biomass carbon and phosphorous in soil. These parameters are not considered relevant for the EU / Japanese risk assessment. In addition, test soils originate from cultivated land from North India and might therefore not be regarded representative for the EU/Japan.
903	Ecotoxicology (incl. pollen/nectar residue)	Jankowska et al.	2007	Effect of the herbicide ROUNDUP 360 SL on the generation time of Aeromonas hydrophila and Pseudomonas fluorescens in lake water .	Polish Journal of Natural Sciences (2007) , Vol. 22, No. 4, pp. 660-669	This publication is dealing with effects of the representative EU formulation (Roundup 360 SL) on the generation time of the aquatic bacteria Aeromonas hydrophila and Pseudomonas fluorescens. No further endpoints were assessed and no anayltical verification of the test item concentrations were conducted. As the evaluated endpoint is is not regarded relatable to the risk assessment, the study was considered as not relevant.
845	Ecotoxicology (incl. pollen/nectar residue)	Kamble et al.	2006	Effect of herbicide glyphosate on DNA , RNA and protein contents of seedlings of Hibiscus cannabinus Linn.	Biosciences Biotechnology Research Asia, (December 2006) Vol. 3, No. 2 A, pp. 431-436	This publication is dealing with effects of glyphosate on macromolecular contents (DNA, RNA and protein) of treated Hibiscus seedlings. As the findings are based on molecular level they cannot be related to the risk

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
						assessment.
418	Ecotoxicology (incl. pollen/nectar residue)	Kramer et al.	2008	Comments on /Evaluation of estrogenic activities of aquatic herbicides and surfactants using a rainbow trout vitellogenin assay/.	Toxicological Sciences, (June 2008) Vol. 104, No. 1, pp. 228-230	This is a letter to the editor (i.e. an opinion article about another different study), where no new data for the RA is provided.
1439	Ecotoxicology (incl. pollen/nectar residue)	Kremer et al.	2009	Glyphosate and glyphosate - resistant crop interactions with rhizosphere microorganisms	European journal of agronomy (2009) , Vol. 31, No. 3, pp. 153-161	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in open-air fields in US under local soil and climate conditions). In addition, glyphosate specifications were not indicated (no details on the used formulation). This work does not present any numerical/tabulated result, just graphical outcomes.
1826	Ecotoxicology (incl. pollen/nectar residue)	Krzysko-Lupicka et al.	2008	Interactions between glyphosate and autochthonous soil fungi surviving in aqueous solution of glyphosate .	Chemosphere, (2008 Apr) Vol. 71, No. 7, pp. 1386-91	The tested material was not identified (just that N-Phosphonomethylglycine used in this study was obtained from commercial formulation by precipitation from its aqueous solution with concentrated hydrochloric acid). In addition, the exposure route (10 grams soil samples were suspended in 90 ml of 1 mM glyphosate solution) is not clear (for how much time?) and seems to not be relevant for EU / Japan regulatory purposes.
1661	Ecotoxicology (incl. pollen/nectar residue)	Kumari et al.	2008	Impact of herbicide (glyphosate) on the biochemical components of the fish , Catla catla	Indian Journal of Environment and Ecoplanning, (2008) Vol. 15, No. 1-2, pp. 434-438	This publication deals with the Glycel® formulation, containing ethoxylated tallow alkyl amines surfactant, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, all findings of this study are based on cellular and molecular level that cannot be related to the risk assessment.
2649	Ecotoxicology (incl. pollen/nectar residue)	Lancaster et al.	2006	Soil Microbial Activity Is Affected by Roundup WeatherMax and Pesticides Applied to Cotton (Gossypium hirsutum)	Journal of agricultural and food chemistry (2006) , Vol. 54, No. 19, pp. 7221-7226, Electronic	The observations presented in this study were caused by mixture of different herbicides and thus not attributable to glyphosate itself (e.g. mixture toxicity). Glyphosate alone data were also provided (only graphically), but a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan, was used. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
429	Ecotoxicology (incl. pollen/nectar residue)	Lee et al.	2009	Comparative effects of the formulation of glyphosate - surfactant herbicides on hemodynamics in swine.	Clinical toxicology (Philadelphia, Pa.), (2009 Aug) Vol. 47, No. 7, pp. 651-8.	Reported results on hemodynamics and death in piglets are according to the publication depending on surfactants (including POEA) and thus not relevant for the risk assessment.
2656	Ecotoxicology (incl. pollen/nectar residue)	Lupwayi et al.	2007	Soil microbial biomass, functional diversity and enzyme activity in glyphosate - resistant wheat-canola rotations under low-disturbance direct seeding and conventional tillage	Soil biology and biochemistry (2007) , Vol. 39, No. 7, pp. 1418-1427	This publication focuses on genetically modified organisms / transgenic crops; no data are directly relevant to glyphosate evaluation. This field study was conducted at six sites on the Canadian prairies and therefore is not dealing with EU / Japan representative uses / conditions (e.g. field locations, soil properties, etc.). Furthermore, the glyphosate

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
						formulation used in this study was not identified (just the application rate) and was mixed with other chemicals and thus the observations are not attributable to glyphosate.
2658	Ecotoxicology (incl. pollen/nectar residue)	Lupwayi et al.	2009	Soil microbial response to herbicides applied to glyphosate - resistant canola	Agriculture, ecosystems and environment (2009) , Vol. 129, No. 1-3, pp. 171-176	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the field survey was conducted on different sites in Canada). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. Some of the treatments are also caused by a mixture of potentially causal factors / chemicals and thus not only attributable to glyphosate. No comparison to control is possible, because there was no control treatment without herbicide application. The study was conducted to compare a glyphosate-resistant canola system with alternative herbicides.
1935	Ecotoxicology (incl. pollen/nectar residue)	Lushchak et al.	2009	Low toxic herbicide Roundup induces mild oxidative stress in goldfish tissues.	Chemosphere, (2009 Aug) Vol. 76, No. 7, pp. 932-7	The glyphosate tested substance in this study is a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. The Roundup formulation is not known. The effects were assessed only at cellular and molecular level that cannot be related to the risk assessment.
109	Ecotoxicology (incl. pollen/nectar residue)	Mccomb et al.	2008	Acute toxic hazard evaluations of glyphosate herbicide on terrestrial vertebrates of the Oregon coast range.	Environmental science and pollution research international, (2008 May) Vol. 15, No. 3, pp. 266-72.	Non relevant route of exposure (i.p.) for mammals.
1612	Ecotoxicology (incl. pollen/nectar residue)	Michalkova et al.	2009	How glyphosate altered the behaviour of agrobiont spiders (Araneae: Lycosidae) and beetles (Coleoptera: Carabidae)	Biological control : theory and application in pest management (2009) , Vol. 51, No. 3, pp. 444-449	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU/Japan glyphosate renewal. In addition, the study design, test system and exposure routes are not relevant for the EU / Japan regulatory purposes. Tested rate is not clear.
975	Ecotoxicology (incl. pollen/nectar residue)	Nakamura et al.	2008	Effects of glyphosate herbicide on soil and litter macro-arthropods in rainforest: Implications for forest restoration	Ecological management and restoration (2008) , Vol. 9, No. 2, pp. 126-133	This publication is dealing with a "Roundup" formulation (Roundup® Bioactive) probably containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, this field study is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in rainforest fields under open-air conditions in Australia).
1602	Ecotoxicology (incl. pollen/nectar residue)	Olurin et al.	2006	Histopathological responses of the gill and liver tissues of Clarias gariepinus fingerlings to the herbicide, glyphosate .	African Journal of Biotechnology, (DEC 18 2006) Vol. 5, No. 24, pp. 2480-2487	This publication does not provide any numerical/graphical result, just digital images of histopathological changes without any measure of these changes and no relation with related chronic toxicological effects. In addition, this

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
						publication does not identify the tested formulation.
755	Ecotoxicology (incl. pollen/nectar residue)	Pelosi et al.	2009	Earthworm community in conventional, organic and direct seeding with living mulch cropping systems.	Agron. Sustainable Dev., Vol. 29, Issue 2, Page 287-295, Publication Year 2009	In this field study comparing different cropping systems for 3 years, the observations in the glyphosate treated plots are caused by a mixture of other compounds/potentially causal factors and thus not attributable to glyphosate itself. In addition, glyphosate specifications and application details and rate were not indicated.
971	Ecotoxicology (incl. pollen/nectar residue)	Pereira et al.	2008	Effects of glyphosate and endosulfan on soil microorganisms in soybean crop .	Planta Daninha (2008) , Vol. 26, No. 4, pp. 825-830	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in open-air field plots in Brazil under local soil and climate conditions). In addition, it only focuses on microbial respiration (CO2 acumulation), which is no longer a variable to consider for the EU / Japan risk assessment
1018	Ecotoxicology (incl. pollen/nectar residue)	Perez et al.	2007	Effects of the herbicide Roundup on freshwater microbial communities : a mesocosm study.	Ecological applications : a publication of the Ecological Society of America, (2007 Dec) Vol. 17, No. 8, pp. 2310-22	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in earthen ponds under open-air conditions in Argentina). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan?. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
3225	Ecotoxicology (incl. pollen/nectar residue)	Quaranta et al.	2009	Why amphibians are more sensitive than mammals to xenobiotics.	PloS one, (2009 Nov 04) Vol. 4, No. 11, pp. e7699. Electronic Publication Date: 4 Nov 2009	Findings of this publication, related to the permeability of frogs and pigs skin to different chemicals including glyphosate are not related to ecotoxicology. In this article glyphosate was not the focus of the study (it deals with general pesticide exposure) and its study design and test system are not relevant for ecotoxicological regulatory purposes
349	Ecotoxicology (incl. pollen/nectar residue)	Ratcliff et al.	2006	Changes in microbial community structure following herbicide (glyphosate) additions to forest soils	Applied soil ecology (2006) , Vol. 34, No. 2-3, pp. 114-124	This study on the effects of glyphosate on the structure of the microbial community in soil is not dealing with EU / Japan representative uses / conditions (e.g. soil was collected from two different ponderosa pine plantations in northern California). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
2966	Ecotoxicology (incl. pollen/nectar residue)	Relyea et al.	2009	The toxicity of Roundup Original Max to 13 species of larval amphibians .	Environmental toxicology and chemistry, (2009 Sep) Vol. 28, No. 9, pp. 2004-8	The Roundup Original Max® formulation used in the study probably contains POEA surfactant (or any similar) which is not permitted in formulated herbicidal products in the EU / Japan. In addition no analytical verification of the test item concentration in the test media was conducted.
1654	Ecotoxicology (incl. pollen/nectar residue)	Riaz et al.	2009	Impact of glyphosate and benzo[a]pyrene on the tolerance of mosquito larvae to chemical	Aquat. Toxicol., Vol. 93, Issue 1, Page 61-69, Publication Year 2009	This study investigates the tolerance of mosquito larvae to several insecticides, having been exposed previously to sub-lethal concentrations of glyphosate. The glyphosate tested

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
				insecticides. Role of detoxification genes in response to xenobiotics.		substance is Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. The direct glyphosate effects on mosquitos conferring increased tolerance to insecticides were assessed only at cellular and molecular level that cannot be related to the risk assessment.
2073	Ecotoxicology (incl. pollen/nectar residue)	Rochfort et al.	2009	NMR-based metabolomics using earthworms as potential indicators for soil health	METABOLOMICS, (MAR 2009) Vol. 5, No. 1, pp. 95-107	This study presents findings regarding metabolics and therefore only based on cellular and molecular level that cannot be related to the risk assessment. In addition, the tested material comes from different sites in Australia and therefore not dealing with EU / Japan representative uses / conditions (e.g. field locations, soil properties, etc.). Furthermore, the test item was Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan, and the observations are caused by mixture of compounds / potentially causal factors and thus not attributable to only glyphosate.
1054	Ecotoxicology (incl. pollen/nectar residue)	Saradhamani et al.	2009	Efficacy of herbicide Glyphosate on oxygen consumption of a fresh water fish , Catla catla	Indian Journal of Environment and Ecoplanning (2009), 16(1), 239-243	In this study, assessing the effects of glyphosate exposure on the rate of fish oxygen consumption after 96 hours, the test design and system are not relevant for the EU / Japan regulatory purposes. In addition, the test item was not identified as it was just indicated that it is glyphosate without further content/purity/source indication (it could be a formulation not relevant to the EU / Japan glyphosate renewal). Furthermore, the study seems to be not reliable at all, as shows several inconsistencies in the reported results' table (percent change in the rate of oxygen consumption at 72 h, significant difference detected for the 0.35 ppm concentration at 72 h, etc.) and text. The statistical analysis was not described and it is not possible to determine if it has been conducted or not.
1620	Ecotoxicology (incl. pollen/nectar residue)	Solomon et al.	2009	Human health and environmental risks from the use of glyphosate formulations to control the production of coca in Colombia: overview and conclusions.	Journal of toxicology and environmental health. Part A, (2009) Vol. 72, No. 15-16, pp. 914-20. Ref: 50	This is a scientific review article where no new data, just secondary information, is provided that can be used for risk assessment. In addition, most of the effects reported in this review were caused by mixture of compounds / potentially causal factors and thus not attributable to glyphosate itself.
397	Ecotoxicology (incl. pollen/nectar residue)	Soso et al.	2007	Chronic exposure to sub-lethal concentration of a glyphosate -based herbicide alters hormone profiles and affects reproduction of female Jundia (Rhamdia quelen).	Environmental Toxicology and Pharmacology, (MAY 2007) Vol. 23, No. 3, pp. 308-313	This publication is not dealing with EU / Japan representative uses / conditions (e.g. the test was conducted in earthen ponds under open-air conditions in Brazil). In addition, it deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
3023	Ecotoxicology (incl. pollen/nectar residue)	Sparling et al.	2006	Toxicity of glyphosate as Glypro and LI700 to red-eared slider (trachemys	Environmental toxicology and chemistry, (2006 Oct) Vol. 25, No.	This study presents observations caused by mixture of compounds (the glyphosate formaltion Glypro and a 3%

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
				scripta elegans) embryos and early hatchlings.	10, pp. 2768-74	solution of the surfactant LI700) and thus not attributable to only glyphosate.
1642	Ecotoxicology (incl. pollen/nectar residue)	Stachowski-Haberkorn et al.	2008	Impact of Roundup on the marine microbial community , as shown by an in situ microcosm experiment.	Aquatic toxicology (Amsterdam, Netherlands), (2008 Sep 29) Vol. 89, No. 4, pp. 232-41	This publication deals with a Roundup formulation, containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan.
2914	Ecotoxicology (incl. pollen/nectar residue)	Thompson et al.	2005	The impact of insecticides and herbicides on the biodiversity and productivity of aquatic communities.	Ecological applications : a publication of the Ecological Society of America (2006) , Vol. 16, No. 5, pp. 2022-2027	This publication deals with a Roundup formulation, containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the study design and test system is not fully relevant for regulatory purposes (All tested organisms included in these aquatic mesocosms were brought to the laboratory from natural unidentified sources and distributed into the different aquaria). Year of publication is 2005.
347	Ecotoxicology (incl. pollen/nectar residue)	Tierney et al.	2006	Changes in juvenile coho salmon electro-olfactogram during and after short-term exposure to current-use pesticides.	Environmental toxicology and chemistry, (2006 Oct) Vol. 25, No. 10, pp. 2809-17	In this literature article the effect of glyphosate and other pesticides on the olfaction of juvenile coho-salmons is examined. The assessed study endpoint is not regarded relevant for the EU / Japanese risk assessment.
2423	Ecotoxicology (incl. pollen/nectar residue)	Tierney et al.	2007	Relating olfactory neurotoxicity to altered olfactory-mediated behaviors in rainbow trout exposed to three currently-used pesticides.	Aquatic toxicology (Amsterdam, Netherlands), (2007 Feb 15) Vol. 81, No. 1, pp. 55-64	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition, the study design and test system (focused on olfactory-mediated behavioral effects) are not relevant for regulatory purposes.
1754	Ecotoxicology (incl. pollen/nectar residue)	Tsui et al.	2006	Influence of glyphosate and its formulation (Roundup super([registered])) on the toxicity and bioavailability of metals to Ceriodaphnia dubia	Environmental Pollution. Vol. 140, no. 2, pp. 59-68. Mar. 2006	In this study, the observations related with glyphosate (IPA salt) were caused by mixture of compounds (metal acute toxicity and accumulation on aquatic invertebrates when previously treated with glyphosate) and thus not attributable to glyphosate itself (e.g. mixture toxicity). The 48-h LC50 was calculated however for Roundup® and therefore dealing with a formulation containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal.
1095	Ecotoxicology (incl. pollen/nectar residue)	Watson et al.	2008	Environmental influences on Acinetobacter sp. strain BD413 transformation in soil	Biology and fertility of soils (2008) , Vol. 45, No. 1, pp. 83-92	In this literature article the effects of Roundup Ready Renew on Acinetobacter sp. strain BD413 transformation in soil were assessed. As the findings are only based on molecular level they cannot be related to the risk assessment.
979	Ecotoxicology (incl. pollen/nectar residue)	Weaver et al.	2007	Effects of glyphosate on soil microbial communities and its mineralization in a Mississippi soil .	Pest management science, (2007 Apr) Vol. 63, No. 4, pp. 388-93	This study consists of two different tests, one field study in USA not dealing with EU / Japan representative uses/conditions (e.g. field locations, soil properties, non-EU monitoring etc.) and one laboratory study with a study

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
						design and system that are not relevant for regulatory purposes. Only C-related (and not N-related) mineralization was measured, which is no longer relevant for the risk assessment.
447	Ecotoxicology (incl. pollen/nectar residue)	Whiteside et al.	2008	Comparison of a score-based approach with risk-based ranking of in-use agricultural pesticides in Canada to aquatic receptors.	Integr. Environ. Assess. Manage., Vol. 4, Issue 2, Page 215-236, Publication Year 2008	This article, presenting a new risk-based approach for ranking pesticides and their potential risk to aquatic life, only contains secondary ecotoxicological information from several sources: The Pesticide Manual of the British Crop Protection Council, USEPA pesticide registration data, the French AGRITOX, European Commission pesticide review reports, and the USEPA ECOTOX database. It does not present any new toxicity data. In addition, this publication deals with general pesticide exposures (not glyphosate specific).
2020	Ecotoxicology (incl. pollen/nectar residue)	Zabaloy et al.	2008	Microbial respiration in soils of the Argentine pampas after metsulfuron methyl, 2,4-D, and glyphosate treatments.	Communications in soil science and plant analysis (2008) , Vol. 39, No. 3-4, pp. 370-385	This publication does not deal with EU / Japan representative uses / conditions (e.g. Argentinian field locations with specific soil properties, etc.). In addition, the study focuses on the effects on microbial respiration (CO2 release) and this is not a data requirement according to EU Regulation 283/2013 anymore. Furthermore, the test item was not fully identified and the test soil had a previous history of pesticide applications that could have altered the diversity and levels of the microbial community.
179	Ecotoxicology (incl. pollen/nectar residue)	Zabaloy et al.	2008	An integrated approach to evaluate the impacts of the herbicides glyphosate, 2,4-D and metsulfuron-methyl on soil microbial communities in the Pampas region, Argentina	Applied soil ecology (2008) , Vol. 40, No. 1, pp. 1-12	This publication is not considered relevant as the used test soils have a reported history of herbicide application. In addition, they originate from agricultural fields of the Pampas region (Argentina) and might therefore not be regarded representative for the EU/Japan.
839	Ecotoxicology (incl. pollen/nectar residue)	Zahra et al.	2006	Effect of glyphosate on various blood parameters of fresh water fishes , Heteropneustes fossilis.	Flora and Fauna (Jhansi) (2006) , Vol. 12, No. 1, pp. 100-104	This publication deals with a Roundup formulation, probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan. In addition, no analytical verification of the test item concentrations in the tested tap water was conducted and the origin/source of the tested fishes is not clear either.
2930	Ecotoxicology (incl. pollen/nectar residue)	Zhidenko et al.	2007	The influence of roundup on the dynamics of histological changes in organs of carps.	Hydrobiological Journal, (2007) Vol. 43, No. 2, pp. 93-99	This publication does provide histological changes after exposure to a Roundup formulation at 0.004 mg/L; no numerical/graphical results are provided. The description of the study design is very limited, the test conditions are poorly described and the effects cannot be related to the risk assessment. Therefore this study is not regarded relevant.
746	Ecotoxicology (incl. pollen/nectar residue)	Zhydenko	2008	Dynamics of the juvenile carps hematological parameters under the impact of herbicides.	Hydrobiological Journal, (2008) Vol. 44, No. 5, pp. 73-80	This publication is dealing with a "Roundup" formulation (no indication of which one) probably containing the surfactant POEA, which is not permitted in formulated herbicidal products in the EU / Japan. This is not the representative formulation for the AIR5 dossier and thus not relevant to the EU / Japan glyphosate renewal. In addition,

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
						the findings are all based on cellular and molecular level (changes of the hematological parameters) that cannot be related to the risk assessment.
1092	Ecotoxicology (incl. pollen/nectar residue)/ Efate	Tsui et al.	2008	Environmental fate and non-target impact of glyphosate -based herbicide (Roundup) in a subtropical wetland.	Chemosphere, (2008 Mar) Vol. 71, No. 3, pp. 439-46. Electronic Publication Date: 26 Dec 2007	The Roundup formulation used in the study contains POEA surfactant which is not permitted in formulated herbicidal products in the EU / Japan. The ecotoxicologically relevant findings of this field study (in situ bioassay of fish in a freshwater & estuarine pond) cannot clearly be related to the application of the Roundup formulation as a very open test design was chosen and test species might be exposed to multiple chemicals/stressors. Environmental fate in a subtropical wetland can for various reasons not readily transferred to agricultural conditions considered relevant.
2830	E-fate	Adams et al.	2007	The Absence of Glyphosate Residues in Wet Soil and the Adjacent Watercourse after a Forestry Application in New Brunswick.	Northern journal of applied forestry (2007) , Vol. 24, No. 3, pp. 230-232	Study design is not relevant for the European regulatory purposes and no relevant endpoint was determined. Glyphosate product was applied at a field site in Canada and a water stream and water saturated soil was analysed.
807	E-fate	Adil et al.	2009	Effect of agricultural chemicals on aquatic ecosystem in Guyana	Global Journal of Environmental Research, (2009) Vol. 3, No. 1, pp. 22-25. CODEN: GJERAW.	Publication is reporting on water monitoring under Non-EU conditions which are not relevant for the enviromental risk assessments. Detected residues in algae are considered to be not relevant for the dietary risk assessment as it is neither clear these algal speciel are suitable for human consuption or ever harvested for human consumption, also residues cannot be attributed to a GAP relevant for EU and might be caused by misuse or accidental spillage uncleare exposure.
743	E-fate	Alexa et al.	2009	Dynamic of glyphosate mineralization in different soil types.	Romanian Agricultural Research (2009) , No. 26, pp. 57-60	Study design not relevant for the European regulatory purposes. Different soils from Romania were incubated with glyphosate for 40 days. Only the evolved CO2 was measured. No endpoints can be derived.
2219	E-fate	Barrett et al.	2007	Phosphate and glyphosate mobility in soil columns amended with roundup	Soil science (2007) , Vol. 172, No. 1, pp. 17-26	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. It was investigated whether moderately low glyphosate application rates could mobilize significant PO43- in coarse-textured soils. No endpoints for risk assessment are generated.
2641	E-fate	Bazot et al.	2008	Simultaneous mineralization of glyphosate and diuron by a consortium of three bacteria as free- and/or immobilized-cells formulations.	Applied microbiology and biotechnology, (2008 Jan) Vol. 77, No. 6, pp. 1351-8	Study design is not relevant for the European regulatory purposes. Three isolated bacteria strains were assessed to study the simulaneous mineralisation of glyphosate and diuron.
703	E-fate	Bhaskara et al.	2006	Direct sensitive spectrophotometric determination of glyphosate by using ninhydrin as a chromogenic reagent in formulations and environmental water samples.	Helvetica Chimica Acta (2006) , Vol. 89, No. 11, pp. 2686-2693	Publication dealing with analytical methods / development. Method validation was performed with field water sampled from irrigated land in India.
2189	E-fate	Carpenter et al.	2008	Pesticide Occurrence and Distribution in the Lower Clackamas River Basin, Oregon, 2000-2005	Scientific Investigations Report. U.S. Geological Survey. no. 2008-5027, 99 pp. 2008	Publication not dealing with EU representative uses / conditions (non-EU monitoring).

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
2230	E-fate	Chen et al.	2007	Photodegradation of glyphosate in the ferrioxalate system.	Journal of hazardous materials, (2007 Sep 05) Vol. 148, No. 1-2, pp. 360-5	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. Wavelength of the used lamp was > 365 nm and the focus of the article was the photodegradation in a ferrioxalate system.
3145	E-fate	Choquette et al.	2009	Water Quality and Evaluation of Pesticides in Lakes in the Ridge Citrus Region of Central Florida	Scientific Investigations Report. U.S. Geological Survey. no. 2008-5178, 55 pp. 2009	Publication not dealing with Japan/EU representative uses / conditions (non-EU monitoring).
2216	E-fate	Comoretto et al.	2007	Pesticides in the Rhone river delta (France): Basic data for a field-based exposure assessment .	Science of the Total Environment, (JUL 15 2007) Vol. 380, No. 1-3, Sp. Iss. SI, pp. 124-132	Publication where glyphosate or a relevant metabolite were not the focus of the publication.
126	E-fate	Da et al.	2007	Adsorption of glyphosate on clays and soils from Parana state: Effect of pH and phosphate competitive adsorption of phosphate .	Brazilian Archives of Biology and Technology, (MAY 2007) Vol. 50, No. 3, pp. 385-394	No endpoints for risk assessment are generated. Only amout of glyphosate adsorbed reported, no Koc/Kfoc.
2667	E-fate	Damonte et al.	2007	Some aspects of the glyphosate adsorption on montmorillonite and its calcined form. Clay and Health - clays in pharmacy, cosmetics, pelotherapy, and environment protection .	Applied Clay Science (2007) , Vol. 36, No. 1/3, pp. 86-94	Study design is not relevant for the European regulatory purposes. Adsorption to specific mineral, no relevant endpoints were determined.
776	E-fate	De et al.	2006	Effect in glyphosate adsorption on clays and soils heated and characterization by FT-IR spectroscopy.	Geoderma, (DEC 15 2006) Vol. 136, No. 3-4, pp. 738-750	Study design not relevant for the European regulatory purposes. Adsorption of glyphosate was tested on clay minerals and soil. The effect of heating on the clay and soils was investigated. The glyphosate concentration in the supernatant was not determined. No endpoints can be derived.
994	E-fate	Djonova et al.	2008	Effects of mechanical and chemical combating Sorghum halepensis (L.) Pers on soil microflora.	Journal of Balkan Ecology (2008) , Vol. 11, No. 4, pp. 383-390	Findings not related to environmental fate. The effect of glyphosate on the microbial polulation was investigated.
614	E-fate	Doublet et al.	2009	Delayed degradation in soil of foliar herbicides glyphosate and sulcotrione previously absorbed by plants : consequences on herbicide fate and risk assessment .	Chemosphere, (2009 Oct) Vol. 77, No. 4, pp. 582-9	Study design not relevant for the European regulatory purposes. Glyphosate was sprayed on leavea of oilseed rape and maize plants instead of bare soil.
2459	E-fate	Ersilia et al.	2008	Researches regarding the microorganisms influence on glyphosate biodegradation	Journal of Agroalimentary Processes and Technologies (2008), 14(2), 498-502	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. No endpoints for risk assessment are generated. The effect of glyphosate on the soil microbial biomass was investigated.
2899	E-fate	Eser et al.	2007	The effects of glyphosate isopropylamine and trifluralin on the carbon mineralization of olive tree soils . Original Title: Zeytin Topraklarinin Karbon Mineralizasyonuna Glyphosate Isopropylamine ve Trifluralin and apos;in Etkileri.	Turkish Journal of Agriculture and Forestry, (2007) Vol. 31, No. 5, pp. 297-302	Study design and test system that are not relevant for the European regulatory purposes and publications dealing with a Roundup formulation and thus not relevant to the EU glyphosate renewal.

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478	E-fate	Ghanem et al.	2007	Concentrations and specific loads of glyphosate , diuron, atrazine, nonylphenol and metabolites thereof in French urban sewage sludge.	Chemosphere, (2007 Nov) Vol. 69, No. 9, pp. 1368-73	Test system not relevant for the European regulatory purposes. The concentration of glyphosate in sewage sludge was determined.
1235	E-fate	Ghanem et al.	2006	Fate of herbicides and nonylphenol in soil - plant - water systems amended with contaminated sewage sludge	Environmental Chemistry Letters. Vol. 4, no. 2, pp. 63-67. Jun 2006	Study design not relevant for the European regulatory purposes. A mixture of compounds was studied.
2675	E-fate	Gimsing et al.	2007	Sorption of glyphosate and phosphate by variable-charge tropical soils from Tanzania.	Geoderma, (FEB 15 2007) Vol. 138, No. 1-2, pp. 127-132	Study design that is not relevant for the European regulatory purposes and Publication generating endpoints that are not relatable to the EU level risk assessment. Competitive sorption of glyphosate and phosphate was investigated.
1655	E-fate	Gomez et al.	2009	Impact of glyphosate application on microbial biomass and metabolic activity in a Vertic Argiudoll from Argentina.	European Journal of Soil Biology, (MAR-APR 2009) Vol. 45, No. 2, pp. 163-167	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. No endpoints for risk assessment are generated. The effect of glyphosate on the soil microbial biomass was investigated.
2362	E-fate	Goudarzi et al.	2009	QSPR Modeling of Soil Sorption Coefficients (KOC) of Pesticides Using SPA-ANN and SPA-MLR.	J. Agric. Food Chem., Vol. 57, Issue 15, Page 7153-7158, Publication Year 2009	Publication where glyphosate was not the focus of the publication. A QSAR model was developed, glyphosate was among the 124 substances used as input data.
787	E-fate	Hu et al.	2009	Effect of Glyphosate on Soil Enzyme	Journal of Agro-Environment Science [J. Agro-Environ. Sci.]. Vol. 28, no. 4, pp. 680-685. 20 Apr 2009	The article is in Chinese.
2213	E-fate	Hushon	2006	Pesticides in Southwest Florida waterways - A report card.	Florida Scientist, (2006) Vol. 69, No. Suppl. 2, pp. 100-116	Publications not dealing with EU representative uses / conditions (non-EU monitoring).
1276	E-fate	Jankowska et al.	2008	Fluctuations in counts of some microorganisms in lake water caused by the herbicide ROUNDUP 360 SL.	Polish Journal of Natural Sciences (2008) , Vol. 23, No. 1, pp. 121-133	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. The effect of glyphosate concentration on the counts of bacteria in lake water was investigated. No endpoints for risk assessment are generated.
2036	E-fate	Klier et al.	2008	Modelling the Environmental Fate of the Herbicide Glyphosate in Soil Lysimeters	Water, air and soil pollution. Focus (2008) , Vol. 8, No. 2, pp. 187-207	Not relevant, as the focus is on development of a model and transgenic soybeans play a major role. The TSCF was only calculated by a model and no results is given. Additonally, glyphosate was applied to plants by foliar application (not to bare soil).
3089	E-fate	Kolpin et al.	2006	Urban contributions of glyphosate and its degradate AMPA to streams in the United States.	Science of the Total Environment (2006) , Vol. 354, No. 2/3, pp. 191-197	Publication not dealing with Japan/European conditions (field location in the United States).
1493	E-fate	Laitinen et al.	2007	Glyphosate translocation from plants to soil - does this constitute a significant proportion of residues in soil	Plant and soil (2007) , pp. 51-60	Study design not relevant for the European regulatory purposes. Translocation of glyphosate (N-(phosphonomethyl)glycine) to plant roots and its impact on detected herbicide residues in sandy loam soil were studied in a glasshouse pot experiment in Finland. Glyphosate was sprayed on leaves of Quinoa plants.
1236	E-fate	Laitinen et al.	2006	Fate of the herbicides glyphosate, glufosinate-ammonium,	Pest Manage. Sci., Vol. 62, Issue 6, Page 473-491, Publication Year	Study design not relevant for the European regulatory purposes. Glyphosate (Roundup ready) was sprayed on

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				phenmedipham, ethofumesate and metamitron in two Finnish arable soils.	2006	glyphosate resistant sugar beet instead of bare soil.
2652	E-fate	Magga et al.	2008	Soil column experiments used as a means to assess transport , sorption , and biodegradation of pesticides in groundwater .	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2008 Nov) Vol. 43, No. 8, pp. 732-41	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. Column leaching was performed with artifical groundwater (not artificial rainwater) and over a period of 6.5 months glyphosate was continuously applied to the column.
712	E-fate	Newton et al.	2008	Dissipation of four forest-use herbicides at high latitudes.	Environmental science and pollution research international, (2008 Oct) Vol. 15, No. 7, pp. 573-83	Publications not dealing with Japan/EU representative uses / conditions (e.g. field location) . Dissipation of glyphosate was investigated in forests of Alaska.
1623	E-fate	Ockerman	2008	Hydrologic Conditions and Quality of Rainfall and Storm Runoff for Two Agricultural Areas of the Oso Creek Watershed, Nueces County, Texas, 2005-07	Scientific Investigations Report. U.S. Geological Survey. no. 2008-5103, 67 pp. 2008	Publication not dealing with Japan/EU representative conditions (i.e. monitoring location). The purpose of this report was to characterize hydrologic conditions and the water quality of rainfall and storm runoff for two primarily agricultural subwatersheds in the Oso Creek watershed in Nueces County (Texas, U.S.).
1917	E-fate	Peruzzo et al.	2008	Levels of glyphosate in surface waters , sediments and soils associated with direct sowing soybean cultivation in north pampasic region of Argentina.	Environmental pollution (Barking, Essex : 1987), (2008 Nov) Vol. 156, No. 1, pp. 61-6	Publication not dealing with Japan/EU conditions (field location in Argentina and a transgenic soybean cultivation area).
1451	E-fate	Pessagno et al.	2008	Glyphosate behavior at soil and mineral-water interfaces.	Environmental pollution (Barking, Essex : 1987), (2008 May) Vol. 153, No. 1, pp. 53-9	Study design not relevant for the European regulatory purposes. Adsorption was tested in solutions with adjusted pH. Isotherms were established according to Langmuir. One soil was previously treated with H2O2 to reduce organic matter content.
1476	E-fate	Rampoldi et al.	2008	Glyphosate mineralization : effect of temperature and soybean and corn crop residues .	Chilean Journal of Agricultural Research (2008) , Vol. 68, No. 1, pp. 13-20	Study design not relevant for the European regulatory purposes. The kinetics of mineralization of glyphosate in stubbles of soybean and corn were investigated. No endpoints for risk assessment are generated.
610	E-fate	Sailaja et al.	2006	Degradation of glyphosate in soil and its effect on fungal population .	Journal of environmental science and engineering, (2006 Jul) Vol. 48, No. 3, pp. 189-90	Study design not relevant for the European regulatory purposes. Glyphosate (Glycel, 41% pure) was sprayed on the foliage of weeds instead of bare soil.
261	E-fate	Sandall et al.	2009	Avoiding Glyphosate and Atrazine Runoff and Groundwater Contamination	Crop watch (2009) , No. 18 Source Note: 2009 June 26, no. 18	Opinion article that provides no new data that can be used for risk assessment. Guidance for farmers on how to avoid runoff of glyphosate and atrazine.
284	E-fate	Santos et al.	2009	Biodegradation of glyphosate in rhizospheric soil cultivated with Glycine max, Canavalia ensiformis and Stizolobium aterrimum.	Planta Daninha (2009) , Vol. 27, No. 4, pp. 781-787	Study design not relevant for the European regulatory purposes. Untreated and previously cultivated Brazilian soil (Red-Yellow Argisol) was incubated with glyphosate for 32 days. Only the evolved CO2 was measured. No endpoints for risk assessment are generated.
479	E-fate	Scribner et al.	2007	Concentrations of Glyphosate, Its Degradation Product, Aminomethylphosphonic Acid, and Glufosinate in Ground-and Surface-	Scientific Investigations Report. U.S. Geological Survey. no. 2007-5122, 112 pp. 2007. URL (Document):	Publication not dealing with Japan/EU representative conditions (i.e. monitoring location). The concentration of glyphosate and AMPA was determined in soil, rainfall, ground- and surface water samples collected in the U.S..

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				Water, Rainfall, and Soil Samples Collected in the United States, 2001-06		
2672	E-fate	Shushkova et al.	2009	Sorption and microbial degradation of glyphosate in soil suspensions	Applied biochemistry and microbiology (2009) , pp. 599-603	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. The adsorption of glyphosate was studied after application of a product (Ground Bio) containing the active agent is glyphosate isopropylamine salt. No endpoints for risk assessment are generated.
1488	E-fate	Starrett et al.	2008	Glyphosate runoff when applied to zoysiagrass under golf course fairway conditions	ACS Symposium Series, (2008) Vol. 997, No. Fate of Nutrients and Pesticides in the Urban Environment, pp. 237-253, 1 plate	Publication not dealing with Japan/EU representative conditions (i.e. non-EU field location). Publication dealing with a Roundup formulation that is not representative for AIR5. The objectives of the study were: (1) to measure glyphosate runoff from zoysiagrass fairways on a golf course in Kansas (U.S.) following the application of Roundup herbicide, (2) to determine glyphosate runoff concentrations and their resulting effect on the environment, and (3) to provide up-to-date data of research findings on pesticide transport when applied to turfgrass.
2691	E-fate	Stenrod et al.	2006	Spatial variability of glyphosate mineralization and soil microbial characteristics in two Norwegian sandy loam soils as affected by surface topographical features	Soil biology and biochemistry (2006) , Vol. 38, No. 5, pp. 962-971	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. The effect of glyphosate concentration on soil physical and microbial properties was investigated. Furthermore, the mineralization rate of glyphosate was determined in different activity samples. No endpoints for risk assessment are generated.
121	E-fate	Wang et al.	2009	Adsorption Kinetics of Glyphosate and Copper(II) Alone and Together on Two Types of Soils	Soil Science Society of America journal (2009) , pp. 1995-2001	No endpoints for risk assessment are generated. Adsorption kinetics were investigated in a flow method (column) experiment, but no adsorption coefficient determined.
568	E-fate	Wang et al.	2006	Cosorption of zinc and glyphosate on two soils with different characteristics.	Journal of Hazardous Materials, (SEP 1 2006) Vol. 137, No. 1, pp. 76-82	Study design not relevant for the European regulatory purposes. Adsorption isotherms were determined for glyphosate in absence and presence of Zn. NaNO3 was used as test solution instead of CaCl2. Isotherms are shown graphically but no linear equations are presented. No endpoints can be derived from the study.
1021	E-fate	Warnemuende et al.	2007	Effects of tilling no-till soil on losses of atrazine and glyphosate to runoff water under variable intensity simulated rainfall	Soil and tillage research (2007) , Vol. 95, No. 1-2, pp. 19-26	Publication not dealing with Japan/EU representative conditions (i.e. field location). The runoff of glyphosate and atrazine was tested on field plots in the U.S..
1899	E-fate	Xu et al.	2009	Land use and riparian effects on prairie wetland sediment properties and herbicide sorption coefficients.	Journal of environmental quality, (2009 Jul-Aug) Vol. 38, No. 4, pp. 1757-65	Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes. Adsorption study performed with sediment of a wetland. Only mean values (5 sampling points and four cores per point) were reported.
641	E-fate	Yoshioka et al.	2006	Determination of Glyphosate and Its Major Metabolite Aminomethylphosphonic Acid in River Water and Tap Water by High-	Bunseki Kagaku [Bunseki Kaguku]. Vol. 55, no. 3, pp. 177-184. 2006. ISSN: 0525-1931	The article is about the development of analytical method to analyze Glyphosate and AMPA in river water and tap water which is considered not relevant for the submission in Japan.

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				Performance Liquid Chromatography with Postcolumn Derivatization Method		
1781	E-fate	Zablotowicz et al.	2006	Influence of watershed system management on herbicide concentrations in Mississippi Delta oxbow lakes.	The Science of the total environment, (2006 Nov 1) Vol. 370, No. 2-3, pp. 552-60. Electronic Publication: 2006-09-26	Publication where glyphosate or a relevant metabolite were not the focus of the publication. Glyphosate was not among the active substances measured in the article.
1477	E-fate	Zhao et al.	2009	Glyphosate mobility in soils by phosphate application: Laboratory column experiments.	Geoderma, (MAR 15 2009) Vol. 149, No. 3-4, pp. 290-297	Study design not relevant for the European regulatory purposes. Adsorption and column experiments were performed with glyphosate. For the adsorption experiments the soil pH twas adjusted to pH 3–9. The flow direction of the column experiment was from bottom to top. According to the OECD 312 guideline, artificial rain should be applied to the soil columns and the leachate collected. No endpoints were determined in the study.
220	Efficacy	Ransom	2009	Applying Glyphosate Pre-Harvest in Small-Grains	Crop and pest report (2009) , Number 12, pp. 7-8 Source Note: 2009 July 29, issue 12	The article is an application recommendation/suggestion from the North Dakota State University (NDSU) to the farmers. The glyphosate-note is just a small part of it.
37	Efficacy	Service	2007	A growing threat down on the farm.	Science, (25 May 2007) Vol. 316, No. 5828, pp. 1114-1117.	The articles provides an overview about the history and market importance of glyphosate, brief description of a mode of action, first resistance cases, advantages of no-till agriculture, possible replacements/supplements for glyphosate resistant crops.
1209	Human safety (metabolism/toxicology)	Acquavella et al.	2006	Exposure misclassification in studies of agricultural pesticides: Insights from biomonitoring	Epidemiology (Jan 2006) Vol. 17, No. 1, pp. 69-74	A algorithm proposed by Dosemeci and colleagues to estimate lifetime average exposure intensity from questionnaire information. The algorithm was evaluated to measure urinary pesticide concentrations for farmers who applied glyphosate. Statistical analyses included nonparametric correlations, assessment of categorical agreement, and categorical evaluation of exposure distributions.
1698	Human safety (metabolism/toxicology)	Amer et al.	2006	In vitro and in vivo evaluation of the genotoxicity of the herbicide glyphosate in mice .	Bulletin of the National Research Centre (Cairo), (2006) Vol. 31, No. 5, pp. 427-446	Information on concentrations is questionable for in vitro part, as M glyphosate/mL medium is no scientific unit for a concentration. It should be noted, that an ip. injection is not a relevant route of administration and thus considered not relevant to human risk assessment.
2086	Human safety (metabolism/toxicology)	Anadon et al.	2008	Neurotoxicological effects of the herbicide glyphosate	Toxicology Letters [Toxicol. Lett.]. Vol. 180, S164 p. 5 Oct 2008	No full text available (congress abstract only)
1147	Human safety (metabolism/toxicology)	Andre et al.	2007	Evaluation of bulky DNA adduct levels after pesticide use: comparison between open-field farmers and fruit growers.	Toxicol. Environ. Chem., Vol. 89, Issue 1, Page 125-139, Publication Year 2007	Groups of farmers were classified according to the main pesticide sprayed (triazoles or chlorothalonil for open-field farmers n=19; captan for fruit growers n=29). Two blood samples were collected on consecutive days for each farmer, and white blood cell bulky DNA adduct levels were evaluated by 32P-postlabelling method. Glyphosate was only detected in 1/29 farmers. No association between glyphosate exposure and bulky adducts was observed.

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						Farmers were exposed to pesticide mixtures, no further information on exposure and the exposed subtances (batch, manufacturer, analytics, adjuvants) were given.
873	Human safety (metabolism/toxicology)	Astiz et al.	2009	Effect of pesticides on cell survival in liver and brain rat tissues.	Ecotoxicology and environmental safety, (2009 Oct) Vol. 72, No. 7, pp. 2025-32	Non-relevant route of exposure (i.p. injections)
206	Human safety (metabolism/toxicology)	Astiz et al.	2009	Antioxidant defense system in rats simultaneously intoxicated with agrochemicals.	Environmental Toxicology and Pharmacology, (NOV 2009) Vol. 28, No. 3, pp. 465-473	Non-relevant route of exposure (i.p. injections)
1469	Human safety (metabolism/toxicology)	Baucom et al.	2008	Glyphosate induces transient male sterility in Ipomoea purpurea	Botany (2008) , Volume 86, Number 6, pp. 587-594, Electronic ISSN: 1916-2804 Source Note: 2008 June, v. 86, no. 6	The article relates to reproduction and fertility in male Ipomoea purpurea (flower - morning-glory). The test item was not identified in the M&M section (although it seems that they used a Roundup formulation probably containing the surfactant POEA (or any similar), which is not permitted in formulated herbicidal products in the EU / Japan). In addition, the study design and test system are not really relevant for the European regulatory purposes (flowering is not a parameter to be used in the RA). Furthermore, an important part of the test was conducted under US field conditions and therefore, not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).
2987	Human safety (metabolism/toxicology)	Benachour et al.	2007	Time-and dose-dependent effects of roundup on human embryonic and placental cells.	Archives of environmental contamination and toxicology, (2007 Jul) Vol. 53, No. 1, pp. 126-33	Excessive doses exceed typical in vitro limit doses. In vitro test system is inappropriate for formulations containing surfactants.
1463	Human safety (metabolism/toxicology)	Benachour et al.	2009	Glyphosate formulations induce apoptosis and necrosis in human umbilical, embryonic , and placental cells.	Chemical research in toxicology, (2009 Jan) Vol. 22, No. 1, pp. 97-105	Excessive doses exceed typical in vitro limit doses. In vitro test system is inappropriate with surfactants
2890	Human safety (metabolism/toxicology)	Caglar et al.	2008	The effect of sub-acute and sub-chronic exposure of rats to the glyphosate -based herbicide Roundup.	Environmental Toxicology and Pharmacology, (JAN 2008) Vol. 25, No. 1, pp. 57-62	The aim of the study was biochemical and histopathological examination of the toxic effects of glyphosate-based herbicide Roundup in rat liver, However the tested Roundup contains POEA which is no longer in the composition of the representative formulation.
2515	Human safety (metabolism/toxicology)	Cericato et al.	2009	Responsiveness of the interrenal tissue of Jundia (Rhamdia quelen) to an in vivo ACTH test following acute exposure to sublethal concentrations of agrochemicals	Comparative Biochemistry and Physiology, Part C: Toxicology and Pharmacology (2009), 149C(3), 363-367	Jundiá (Rhamdia quelen) [catfish]; not relevant species.
1411	Human safety (metabolism/toxicology)	Climent et al.	2008	Glyphosate Poisoning	Clinical Toxicology [Clin. Toxicol.]. Vol. 46, no. 5, p. 419. Jun 2008	The publication is reporting effects after a 39-year-old male patient who consumed intentionally more than 200 ml of glyphosate. This is not relevant for glyphosate dossier and risk assessment.
2294	Human safety (metabolism/toxicology)	Dallegrave et al.	2007	Pre-and postnatal toxicity of the commercial glyphosate formulation in Wistar rats .	Archives of toxicology, (2007 Sep) Vol. 81, No. 9, pp. 665-73	Non-relevant formulation tested

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2159	Human safety (metabolism/toxicology)	El-Shenawy	2009	Oxidative stress responses of rats exposed to Roundup and its active ingredient glyphosate .	Environmental Toxicology and Pharmacology, (NOV 2009) Vol. 28, No. 3, pp. 379-385	The publication is reporting information on oxidative stress responses to rats exposed to Roundup and its active ingredient glyphosate; however using intraperitoneal route of exposure which is not relevant for risk assessment.
2207	Human safety (metabolism/toxicology)	Fisher et al.	2008	Pesticide-associated pemphigus vulgaris.	Cutis, (2008 Jul) Vol. 82, No. 1, pp. 51-4	Case report 40 year old men with pemphigus vulgaris, developed within days of a one-time heavy exposure to fumes of burning glyphosate. No definded information on exposure and the exposed subtance (batch, manufacturer, analytics, adjuvants) were given.
1592	Human safety (metabolism/toxicology)	Gardner et al.	2008	Herbicides, glyphosate resistance and acute mammalian toxicity : simulating an environmental effect of glyphosate - resistant weeds in the USA.	Pest management science, (2008 Apr) Vol. 64, No. 4, pp. 470-8	Usage field-level data to assess glyphosate-resistant (GR) technology with a mammalian toxicity environmental indicator. Use is made of Agricultural Resource Management Survey (ARMS) data collected by the United States Department of Agriculture (USDA) to calculate actual farm-level LD50 doses, and a treatment effect regression model is employed to test the hypotheses. The article is dealing wiht model prediction which is not a toxicological endpoint and then not relevant for risk assessment.
1388	Human safety (metabolism/toxicology)	Gasnier et al.	2009	Glyphosate -based herbicides are toxic and endocrine disruptors in human cell lines.	Toxicology, (2009 Aug 21) Vol. 262, No. 3, pp. 184-91	Excessive doses exceed typical in vitro limit doses. In vitro test system is inappropriate with formulation containing surfactants.
1389	Human safety (metabolism/toxicology)	Gehin et al.	2006	Glyphosate -induced antioxidant imbalance in HaCaT: The protective effect of vitamins C and E.	Environmental Toxicology and Pharmacology, (JUL 2006) Vol. 22, No. 1, pp. 27-34	Roundup 3 plus®, induced significant changes in cellular antioxidant status as a glutathione depletion, enzymatic (catalase, glutathione-peroxidase and superoxide dismutase) disorders, and increased lipid peroxidation. Tested product contains 8% (m/m) polyoxyethylene amine (POEA), which is no longer in the composition of the representative formulation.
1103	Human safety (metabolism/toxicology)	Heras-Mendaza et al.	2008	Erythema multiforme-like eruption due to an irritant contact dermatitis from a glyphosate pesticide.	Contact dermatitis, (2008 Jul) Vol. 59, No. 1, pp. 54-6	Case report 37 year old female gardener noticed redness on her arms which became eczematous on day 2. At 5 day erythemato-purpuric plaques appeared on the skin of the upper extremities as well as target-like lesions on the abdomen, axillae and groin. After recovery, patch tests performed with the Spanish Standard series (True Test and Chemotechnique) and the Pesticide series (Martı´ Tor , Barcelona, Spain) were negative. The observed irritant contact dermatitis (ICD) was developed by sweat or wet conditions. Additionally, she delayed rinsing off the herbicide. Tested product contains polyoxyethylene amine (POEA), which is no longer in the composition of the representative formulation.
2880	Human safety (metabolism/toxicology)	Lee et al.	2008	The early prognostic factors of glyphosate - surfactant intoxication.	The American journal of emergency medicine, (2008 Mar) Vol. 26, No. 3, pp. 275-81	Case study on intoxicated patients (58 patients (19 men and 39 women; age, 48.8 ± 15.8 years)) of Chang Gung Memorial Hospital, Taiwan from April 1996 to March 2003

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						and Taichung Veterans General Hospital, Taiwan from April 2000 to October 2003. No information on substance, administered dose and incidence of intoxication for the patients are given. The intake of the substance was only confirmed via physical examination and statements of patients/witnesses (no analytical analysis was performed).
1083	Human safety (metabolism/toxicology)	Lerda	2009	Endocrine disruptors (ED) and human exposure	Research and Reviews in BioSciences, (2009) Vol. 3, No. 2-3, pp. 106-111	In occupational exposure studies, the exposed and control individuals' blood, urine or sperm samples were used, mainly to determine the level of exposure. No definded information on time and/or way of exposure and the exposed subtance (batch, manufacturer, analytics, adjuvants) were given. The levels of several pollutants were studied as well as other biochemical parameters related to exposure (gentox and mutagenesis, sperm quality, prostate, neurobehaviuor, cancer). The observed effect were not assignable to the reasoning chemical.
709	Human safety (metabolism/toxicology)	Levine et al.	2007	Disrupting mitochondrial function with surfactants inhibits MA-10 Leydig cell steroidogenesis	Cell Biology and Toxicology, (2007) Vol. 23, No. 6, pp. 385-400	The study results demonstrate how perturbation of the mitochondrial membrane by surfactants inhibits import, processing, and cholesterol transfer activity and underscore the importance of including sensitive assays that evaluate mitochondrial function when screening for potential effects on steroidogenesis with in vitro test systems. The roundup product tested contains 16.5% glyphosate-isopropylamine salt (which corresponds to approximately 12.2% glyphosate acid) and 6.1% MON 0818 (POEA). POEA is no longer in the composition of the representative formulation.
1338	Human safety (metabolism/toxicology)	Manas et al.	2009	Genotoxicity of glyphosate assessed by the comet assay and cytogenetic tests.	Environmental Toxicology and Pharmacology (2009) , Vol. 28, No. 1, pp. 37-41	This study applied 3 genotoxicity tests with obvious deviations to current guidelines. The i.p. route of exposure used for the micronucleus assay renders the study irrelevant for human exposure. In the in vitro assays most concentrations used were above 1 mM. Because it is physiologically not possible to attain such concentrations in standard regulatory in vivo testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in in vivo test systems, the results of the in vitro test are not considered relevant for human health risk assessment of glyphosate. Positive in vitro findings were only observed at concentrations above 1 mM.
2210	Human safety (metabolism/toxicology)	Mink et al.	2008	Pesticides and prostate cancer : A review of epidemiologic studies with specific agricultural exposure information.	European Journal of Cancer Prevention, (April 2008) Vol. 17, No. 2, pp. 97-110	Publication is a Secondary information (e.g. scientific or regulatory reviews) and as such not relevant for the risk assessments. Data of primary research atricles matching search terms of the Glyphosate search are evaluated elsewhere in the Literature review.

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
1158	Human safety (metabolism/toxicology)	Mladinic et al.	2009	Evaluation of genome damage and its relation to oxidative stress induced by glyphosate in human lymphocytes in vitro .	Environmental and molecular mutagenesis, (2009 Dec) Vol. 50, No. 9, pp. 800-7	This study is a non-GLP, non-guideline in vitro study although it meets generally accepted scientific principles. However, due to the occurrence of apoptosis, a clear conclusion on the relevance of the positive response cannot be reached.
246	Human safety (metabolism/toxicology)	Mladinic et al.	2008	Assessment of oxidative DNA damage by glyphosate applying hOGG1 modified comet and micronucleus assay	Toxicology Letters [Toxicol. Lett.]. Vol. 180, pp. S170-S171. 5 Oct 2008	Abtract only; data presented refer to Mladinic et al. 2009
600	Human safety (metabolism/toxicology)	Moura et al.	2009	Cytogenetic biomonitoring of Brazilian workers exposed to pesticides: Micronucleus analysis in buccal epithelial cells of soybean growers.	Mutat. Res., Genet. Toxicol. Environ. Mutagen., Vol. 675, Issue 1-2, Page 1-4, Publication Year 2009	MNT analysis of buccal epithelial cells of soybean growers. 29 Brazilian workers exposed to pesticides in soybean fields and in 37 non-exposed individuals. Participants were grouped according theit smoking and drinik habbits. No definded information on exposure and the exposed subtances were given.
2813	Human safety (metabolism/toxicology)	Naydenova et al.	2007	Synthesis, cytotoxicity and clastogenicity of novel alpha-aminophosphonic acids.	Amino acids, (2007 Nov) Vol. 33, No. 4, pp. 695-702	This study is a non-GLP, non-guideline conforming in vivo study. The cytotoxicity, clastogenic and antiproliferative effect of different substances are testes. No informations on test items (batch, expiration date, storage, manufacturer) are given. Characterization of newly synthetized derivates, where glyphosate was used as reference substance fot cytotoxicity.
1019	Human safety (metabolism/toxicology)	Oliveira et al.	2007	Effects of the herbicide Roundup on the epididymal region of drakes Anas platyrhynchos.	Reproductive toxicology (Elmsford, N.Y.), (2007 Feb) Vol. 23, No. 2, pp. 182-91	Study on male ducks (Anas platyrhynchos); non-relevant species for risk assessment.
1082	Human safety (metabolism/toxicology)	Orton et al.	2009	Endocrine Disrupting Effects of Herbicides and Pentachlorophenol: In Vitro and in Vivo Evidence.	Environ. Sci. Technol., Vol. 43, Issue 6, Page 2144-2150, Publication Year 2009	12 environmentally relevant pesticides (11 herbicides and pentachlorophenol (PCP)) were tested for their endocrine disrupting potential in two in vitro assays. Glyphosate was not tested in the study. Xenopus oocytes were used to measure effects on the ovulatory response and ovarian steroidogenesis.
1130	Human safety (metabolism/toxicology)	Paz-Y-Mino et al.	2007	Evaluation of DNA damage in an Ecuadorian population exposed to glyphosate .	Genetics and Molecular Biology, (2007) Vol. 30, No. 2, pp. 456-460	This publication is assessed to be not relevant for human health risk assessment in the EU, as the glyphosate formulation (Roundup Ultra) was applied at much higher dose rates (20x maximum application rate) than recommended for the intended uses in the EU. Potential confounding effects from excess toxicity are thus compromising the relevance of this publication, especially since they were not sufficiently accounted for by the authors. In addition, the herbicide was combined with the adjuvant “Cosmoflux 411F”, which will not be used in the EU, and might influence the results and interpretations drawn from the Comet Assay.
1340	Human safety (metabolism/toxicology)	Poletta et al.	2009	Genotoxicity of the herbicide formulation Roundup (glyphosate) in broad-snouted caiman (Caiman	Mutation research, (2009 Jan 31) Vol. 672, No. 2, pp. 95-102	Comet assay and Micronucleus (MN) test on erythrocytes obtained from blood of hatched broad-snouted caiman (Caiman latirostris); non-relevant species for risk

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
				latirostris) evidenced by the Comet assay and the Micronucleus test.		assessment.
401	Human safety (metabolism/toxicology)	Prasad et al.	2009	Clastogenic Effects of Glyphosate in Bone Marrow Cells of Swiss Albino Mice	Journal of Toxicology [J. Toxicol.]. Vol. 2009, [np]. 2009	This study applied 2 in vivo genotoxicity tests, both with obvious deviations to current guidelines. The i.p. route of exposure used for the micronucleus and chromosomal aberration assay renders the study irrelevant for human exposure.
3011	Human safety (metabolism/toxicology)	Raipulis et al.	2009	Toxicity and Genotoxicity Testing of Roundup	Proceedings of the Latvian Academy of Sciences (2009) , Vol. 63, No. 1-2, pp. 29-32	The tested Roundup BIO formulation (Monsanto, Brussels, Belgium) contains polyoxyethylene amine (POEA), which is no longer in the composition of the representative formulation.
2134	Human safety (metabolism/toxicology)	Remor et al.	2009	Occupational exposure of farm workers to pesticides: Biochemical parameters and evaluation of genotoxicity.	Environ. Int., Vol. 35, Issue 2, Page 273-278, Publication Year 2009	Evaluation of the activities of butyrylcholinesterase (BChE) and -aminolevulinic acid dehydratase (ALA-D) enzymes, hematol., lipid parameters and genotoxicity using Comet assay in peripheral blood leukocytes and a micronucleus (MN) test in oral mucosa cells of agricultural workers. 37 male pesticides appliers (sprayers) exposed since childhood to a mixture of pesticides. No definded information on exposure or subtances were given.
8	Human safety (metabolism/toxicology)	Sakamoto et al.	2007	A 52-week feeding study of genetically modified soybeans in F344 rats .	Shokuhin eiseigaku zasshi. Journal of the Food Hygienic Society of Japan, (2007 Jun) Vol. 48, No. 3, pp. 41-50.	No glyphosate data included in the article.
603	Human safety (metabolism/toxicology)	Simoniello et al.	2008	DNA damage in workers occupationally exposed to pesticide mixtures.	J. Appl. Toxicol., Vol. 28, Issue 8, Page 957-965, Publication Year 2008	Evaluation of 54 subjects occupationally exposed to a large number of pesticides (directly or indirectly) and 30 subjects as a control group using the quantification of DNA damage level by means of the alkaline Comet assay and the evaluation of repair processes. No definded information on time and/or way of exposure and the exposed subtance (batch, manufacturer, analytics, adjuvants) were given.
2057	Human safety (occupational exposure)	Aleguas et al.	2007	Morbidity of Agricultural Chemical Use in Guyana	Clinical Toxicology [Clin. Toxicol.]. Vol. 45, no. 4, p. 361. May 2007	Only an abstract available without details
1716	Human safety (occupational exposure)	Colt et al.	2007	Inferring past pesticide exposures: A matrix of individual active ingredients in home and garden pesticides used in past decades.	Environmental Health Perspectives, (Feb 2007) Vol. 115, No. 2, pp. 248-254	Describes the development of an exposure classification tool to classify pesticide exposure status. Article does not report pesticide exposure status or health outcomes for any study population.
2172	Human safety (occupational exposure)	Monge et al.	2007	Parental occupational exposure to pesticides and the risk of childhood leukemia in Costa Rica.	Scandinavian Journal of Work Environment and Health, (AUG 2007) Vol. 33, No. 4, pp. 293-303	Publication describes general pesticide, exposures, general herbicide exposures, or collective exposures of "paraquat, chlorothalonil, glyphosate, and others."
2452	Human safety (occupational exposure)	Ogg	2008	Research: Pesticide Exposure Extends to Applicators Family	Crop watch (2008) , No. 8 Source Note: 2008 Apr. 25, no. 8	Non peer-reviewed web publication of University of Nebraska.
137	Human safety (occupational exposure)	Spiller et al.	2008	Agricultural chemical exposure in small farmers in Guyana.	Toxicological and Environmental Chemistry, (2008) Vol. 90, No. 2, pp. 361-365.	Publication describes general pesticide exposures (not glyphosate specific)
306	Human safety	Ugaddan et al.	2009	Brain acetylcholinesterase (AChE)	Asia Life Sciences, (JAN-JUN	Study in Oreochromis niloticus L. (tilapia, a cichlid fish);

Submission Number	Technical section	Author(s)	Year	Title	Source	Justification for non-relevance
	(occupational exposure)			activity and liver melanomacrophage centers (MMCs) formation in Nile tilapia (Oreochromis niloticus L.) following exposure to glyphosate herbicide.	2009) Vol. 18, No. 1, pp. 73-85. ISSN: 0117-3375.	not a relevant species for risk assessment. It focuses on the effects of an unidentified formulation of glyphosate on fishes (Nile tilapia), the study only refers to findings based on cellular and molecular level that cannot be related to the Ecotox risk assessment.
2648	Human safety (occupational exposure)	Zhai et al.	2008	Skin decontamination of glyphosate from human skin in vitro .	Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association, (2008 Jun) Vol. 46, No. 6, pp. 2258-60	The article is comparing three model decontaminant solutions for their ability to remove a glyphosate (only used as model herbicide) from an in vitro model. Glyphosate is only used as a control substance (not tested with different doses).
2166	Human safety (toxicology)	Perez-Herrera et al.	2008	PON1Q192R genetic polymorphism modifies organophosphorus pesticide effects on semen quality and DNA integrity in agricultural workers from southern Mexico	Toxicology and Applied Pharmacology, (2008) Vol. 230, No. 2, pp. 261-268	Semen quality of agricultural workers with general high exposure to pesticides (29 different substances), mainly focused on orhanophosphors, was investigated. No definded information on exposure or subtances were given.

Appendix 1: ORIGINAL SEARCH QUERY - July 2006 – December 2009

Preparing the search queries on STN:

```
    FILE 'STNGUIDE' ENTERED AT 18:54:53 ON 01 JUL 2020
CHARGED TO COST=113898
L1          QUE SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
            GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
            5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
            69254-40-6
            SAVE TEMP L1 GLY1/Q
L2          QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
            HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
            IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
            EYE? OR IRRIT? OR SENSI? OR ALLERG?
L3          QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
            GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
            METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
            ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L4          QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
            CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
            OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
            OR HORMON? OR GONAD? OR DISRUPT?
L5          QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
            MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
            PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
            EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
            OCCUPAT?
L6          QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
            MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
            CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
            RISK ASSESSMENT?
L7          QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
            OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
            METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
            MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L8          QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
            PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
            HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
            OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L9          QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
            OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L10         QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
            DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
            SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
            AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L11         QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
             OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
            OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
            ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L12         QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
            PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
            HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
            MOVEMENT OR REMOVAL OR DRINKING WATER OR WATER TREATMENT
            PROCESSES
L13         QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
            NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
            OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
            OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
            PERSISTENCE OR LIGAND
L14         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
            ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
            BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
            EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT? OR BIODIVERS? OR
            PROTECTION GOALS OR ECO?
L15         QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
            OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
            OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
            OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
            OR ALG? OR CHIRON?
L16         QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
            LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
            INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
            APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR QUE PLANT
            AND (SUBMERGE? OR EMERGE?)
L17         QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
            FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
            RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
            ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
            PARASITOID
L18         QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
            OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
            OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
            MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
            NITROGEN
L19         QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
            SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
            ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
            OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
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Literature Review Report

Scientific peer-reviewed open literature for the approval of pesticide active substances glyphosate and metabolites

as under Article 8(5) of Regulation (EC) No 1107/2009

(Ref. EFSA Journal 2011; 9(2) 2092)

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Sponsor
[redacted]

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Content

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Disclaimer

The information contained herein has been obtained from sources believed to be the most reliable. Every effort has been made to ensure completeness of data. However, no database search can be completely comprehensive, and it is possible that relevant documents have been omitted.

All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

1 Summary

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA Guidance document EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009"*.

In addition, a recommendation by the Assessment Group on Glyphosate (AGG) on how to present the literature search in the dossier has been followed. Please refer to Appendix 1 (page 283) for more details.

The objective of the literature search was to identify and assess scientific peer-reviewed open literature published within the 10 years prior to the dossier submission date for relevance in the risk assessment of glyphosate and its metabolites regarding toxicity, ecotoxicity, environmental and consumer risk as specified in Article 8(5) of Regulation (EC) No 1107/2009.

The literature search was conducted accessing 11 bibliographic databases via the service provider STN.

Due to a large amount of public literature available for glyphosate, the search has been divided into six parts. Please refer to Appendix 2 (page 284) to see the article selection process in detail.

All six parts of the literature search were combined, and upon removal of duplicates 11,326 articles in total were identified. All 11,326 articles were subsequently assessed for their relevance at title/abstract level (via "rapid assessment" according to the procedure and requirements in the EFSA Guidance document EFSA Journal 2011;9(2):2092 *"Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009"*).

A total of 9,784 of the 11,326 articles were identified as "non-relevant" in the rapid assessment (e.g. publications dealing with chemical synthesis, efficacy, analytical methods etc.) and excluded from further evaluation. Due to the large quantity of data, and as agreed with the AGG, the list of articles and the justification for their non-relevance is provided in a standalone Literature Review Excel File.[2]

For the remaining 1,542 articles, identified as potentially "relevant" or of "unclear relevance" in the rapid assessment, the full-text documents[3] have been reviewed in detail ("detailed assessment").

Total of 852 articles of the 1,542 articles were identified as "non-relevant" in the detailed assessment and were excluded from further evaluation. The list of the articles and the justification for their non-relevance is provided in Table 38.

The remaining 690 articles identified as "relevant" in the detailed assessment were classified according to the EFSA Guidance Document (Point 5.4.1).

Category A) For articles, which appeared to be relevant after the detailed assessment and provided data for establishing or refining risk assessment parameters a reliability assessment has been performed. For articles identified as reliable or reliable with restrictions, summaries have been compiled and are presented in the MCA / MCP part of the respective dossier section (ecotoxicology, environmental fate, residues, toxicology). The list of these category A & reliable / reliable with restrictions articles can be found in Table 32 and Table 33 of this Literature Review Report document.

[1] (aminomethyl)phosphonic acid (AMPA), N-acetyl-AMPA, N-acetyl-glyphosate, (hydroxymethyl)phosphonic acid (HMPA), N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA, methylphosphonic acid and N-methylglyphosate.
[2] Please note that the Literature Review Excel File will be submitted on the USB hard drive as a standalone document.
[3] All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

Category B) For articles relevant to the data requirement but in opinion of the applicant providing only supplementary information that does not alter existing risk assessment a justification for such decision is provided. The list of these category B articles and the justifications can be found in Table 34 and Table 35 of this Literature Review Report document.

Category C) For articles of an unclear relevance an explanation is provided why the relevance could not be determined. The list of these category C articles and the explanations can be found in Table 36 and Table 37 of this Literature Review Report document.

The full outcome of the literature search for all technical sections is provided in Table 1.

Table 1: Summary of the literature review

Section	Number of articles found	Rapid assessment (title/abstract level)		Detailed assessment (full-text level)	
		non-relevant articles	potentially relevant / unclear relevance	non-relevant articles	relevant articles (category A+B+C)
Efficacy / Agronomy*	4324	4324	n.a.	n.a.	n.a.
Analytical methods*	117	117	n.a.	n.a.	n.a.
Others non-relevant categories*	2430	2430	n.a.	n.a.	n.a.
Ecotoxicology	1464	918	546	398	148
E-fate	1062	759	303	132	171
Residues	475	405	70	30	40
Toxicology	1454	831	623	292	331
Total	**11326**	**9784**	**1542**	**852**	**690**

*Efficacy / Agronomy (e.g. reporting desired effects on organisms to be controlled) and development of analytical methods (artificial measurements) do not provide information useful/required for the environmental or human safety risk assessment. The category "others non-relevant categories" covers a wide range of scientific publications which are not related to glyphosate or its metabolites or are not related to exposure of humans or the environment to glyphosate or its metabolites and thus not relevant for the risk assessments.

The full outcome of the relevant articles after full-text assessment is provided in Table 2.

Table 2: Relevant articles by full text level – according to the EFSA GD, Point 5.4.1

	Relevant articles by full-text (EFSA GD, Point 5.4.1)*		
Section	**Category A***	**Category B***	**Category C***
Ecotoxicology	10	135	3
E-fate	97+1**	73	0
Residues	11	19	10
Toxicology	60	265	6
Total	**178+1****	**492**	**19**

*Category A = relevant articles, Category B = relevant but supplementary articles, Category C = articles of unclear relevance.
** One e-fate entry (+1) is an erratum to the respective e-fate article.

2 Introduction

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA Guidance document EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009"*.

In addition, a recommendation by the Assessment Group on Glyphosate (AGG) on how to present the literature search in the dossier has been followed. Please refer to Appendix 1 (page 283) for more details.

The objective of the literature search was to identify and assess scientific peer-reviewed open literature published within the 10 years prior to the dossier submission date for relevance in the risk assessment of glyphosate and its metabolites regarding toxicity, ecotoxicity, environmental and consumer risk as specified in Article 8(5) of Regulation (EC) No 1107/2009.

The search has been conducted via the online service provider STN (www.stn-international.de) that provides access to a broad range of databases and to published research, journal literature, patents, structures, sequences, properties, and other data.

To offer a comprehensive literature search covering the requirements of the EFSA Guidance Document eleven databases have been used: AGRICOLA, BIOSIS, CABA, CAPLUS, EMBASE, ESBIOBASE, MEDLINE, TOXCENTER, FSTA, PQSCITECH, and SCISEARCH.

Due to a large amount of public literature available for the active substance glyphosate, the search has been divided into six parts. Please refer to Table 3 for more details on the six searches.

Table 3: Overview of the searches conducted for glyphosate and its metabolites

Search	Performed for	Covering publication period	Conducted on
Part 0	glyphosate, AMPA, N-acetyl-AMPA and N-acetyl-glyphosate	Jan 2010 – Dec 2011	28th Oct 2019
Part 1	glyphosate, AMPA, N-acetyl-AMPA and N-acetyl-glyphosate	Jan 2012 – Dec 2017	08th Jun 2018.
Part 2a	glyphosate, AMPA, N-acetyl-AMPA and N-acetyl-glyphosate	Jan 2018 – Dec 2018	04th Jul 2019
Part 2b		Jan 2019 – Jun 2019	10th Jul 2019
Part 3	glyphosate, AMPA, N-acetyl-AMPA and N-acetyl-glyphosate	Jul 2019 – Dec 2019	7th Jan 2020
Part 4	HMPA	Jan 2010 – Feb 2020	24th Feb 2020
Part 5a	N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA	Jan 2010 – Feb 2020	27th Feb 2020
Part 5b	methylphosphonic acid	Jan 2010 – Feb 2020	27th Feb 2020
Part 6	N-methylglyphosate	Jan 2010 – April 2020	04th May 2020

AMPA = (aminomethyl)phosphonic acid
HMPA = (hydroxymethyl)phosphonic acid

As the number of records returned by a "single concept search"[4] was extremely large for the searches Part 0, Part 1, Part 2, Part 3 and Part 5b a "focused search for grouped data requirements"[5] have been performed (a combination of a substance search and "search filters" defined for the four relevant sections – ecotoxicology, toxicology, environmental fate, and residues).
A "single concept search" was used for the searches Part 4, Part 5a and Part 6.

Regarding details on the bibliographic databases used in the literature searches, please refer to Table 4 below.

Regarding the number of articles retrieved for all six searches, please refer to Table 5.

For the full outcome of the literature search for the individual technical sections, please refer to Chapter 3 (page 25).

[4] Definition by the EFSA GD document: single concept search = using the active substance names and its synonyms.
[5] Citation from the EFSA GD: *If the number of summary records returned by a single concept search is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

2.1 Bibliographic databases used in the literature review

Table 4: Overview of the databases used in the literature review

Data requirement(s) captured in the search	**Details of the searches**			
	1. AGRICOLA	**2. BIOSIS**	**3. CABA**	**4. CAPLUS**
Justification for choosing the source:	Provides literature from agriculture and related fields, e.g. biology, biotechnology, botany, ecology etc.	Provides the most comprehensive and largest life science literature, e.g. biosciences, biomedicine etc.	Provides literature from agriculture and related sciences, e.g. biotechnology, forestry, veterinary medicine etc.	Provides literature from chemistry and related fields, e.g. biochemistry, chemical engineering etc.
Number of records in the database at the time of search:	Part 1: > 5.7 million (06/2017); Part 2: > 6.1 million (05/2018); Part 0, 3, 4, 5a&b, 6: > 6.7 million (09/2019)	Part 1: > 25.7 million (03/2017); Part 0, 2, 3, 4, 5a&b, 6: > 27.8 million (04/2019)	Part 1: > 8.6 million (06/2017); Part 0, 2, 3, 4, 5a&b, 6: > 8.9 million (05/2018)	Part 1: > 45 million (03/2017); Part 2: > 48.7 million (11/2017); Part 0, 3, 4, 5a&b, 6: > 50.7 million (08/2019)
Database update:	Monthly	Weekly	Weekly	Daily updates bibliographic data; weekly updates indexing data
Date of the search:	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May
Database covers records:	1970-present	1926-present	1973-present	1907-present and more than 180,000 pre-1907
Date of the latest database update:	Part 0: 4 Oct 2019; Part 1: 5 Jun 2018; Part 2a&b: 3 Jul 2019; Part 3: 4 Dec 2019; Part 4: 8 Jan 2020; Part 5a&b: 8 Jan 2020; Part 6: 2 Apr 2020	Part 0: 23 Oct 2019; Part 1: 6 Jun 2018; Part 2a&b: 3 &10 Jul 2019; Part 3: 1 Jan 2020; Part 4: 19 Feb 2020; Part 5a&b: 26 Feb 2020; Part 6: 29 Apr 2020	Part 0: 23 Oct 2019; Part 1: 6 Jun 2018; Part 2a&b: 3 &10 Jul 2019; Part 3: 18 Dec 2019; Part 4: 19 Feb 2020; Part 5a&b: 26 Feb 2020; Part 6: 30 Apr 2020	Part 0: 27 Oct 2019; Part 1: 7 Jun 2018; Part 2a&b: 7 &9 Jul 2019; Part 3: 6 Jan 2020; Part 4: 23 Feb 2020; Part 5a&b: 25 Feb 2020; Part 6: 3 May 2020
Language limit:	No	No	No	No
Document types <u>excluded</u> that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are listed below.			
Total number of records retrieved:	Part 0: 412; Part 1: 1483; Part 2: 494; Part 3: 181; Part 4: 4; Part 5a&b: 0&91; Part 6: 6	Part 0: 583; Part 1: 2216; Part 2: 792; Part 3: 224; Part 4: 10; Part 5a&b: 1&150; Part 6: 6	Part 0: 1018; Part 1: 3418; Part 2: 669; Part 3: 377; Part 4: 3; Part 5a&b: 0&36; Part 6: 16	Part 0: 899; Part 1: 3036; Part 2: 809; Part 3: 339; Part 4: 28; Part 5a&b: 4&616; Part 6: 27

Table 4: Overview of the databases used in the literature review (continued)

Data requirement(s) captured in the search	**Details of the searches**		
	5. MEDLINE	**6. EMBASE**	**7. TOXCENTER**
Justification for choosing the source:	Provides literature from every area of medicine.	Provides literature from biomedicinal and pharmaceutical fields, e.g. bioscience, biochemistry, human medicine, forensic science, paediatrics, pharmacy, pharmacology, drug therapy, psychiatry, public health, biomedical engineering, environmental science.	Provides literature on pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals.
Number of records in the database at the time of search:	Part 1: > 27.1 million (04/2017); Part 2: > 28.7 million (08/2018); Part 0, 3, 4, 5a&b, 6: > 30 million (08/2019)	Part 1: > 32.7 million (07/2017); Part 2: > 34.3 million (08/2018); Part 0, 3, 4, 5a&b, 6: > 36.4 million (08/2019)	Part 1: > 12.9 million (04/2017); Part 2: > 13.6 million (08/2018); Part 0, 3, 4, 5a&b, 6: > 14.4 million (08/2019)
Database update:	Six times each week, with an annual reload	Daily	Weekly
Date of the search:	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May
Database covers records:	1946-present	1974-present	1907-present
Date of the latest database update:	Part 0: 27 Oct 2019; Part 1: 7 Jun 2018; Part 2a&b: 7 &9 Jul 2019; Part 3: 6 Jan 2020; Part 4: 23 Feb 2020; Part 5a&b: 26 Feb 2020; Part 6: 3 May 2020	Part 0: 25 Oct 2019; Part 1: 7 Jun 2018; Part 2a&b: 5 &9 Jul 2019; Part 3: 6 Jan 2020; Part 4: 20 Feb 2020; Part 5a&b: 26 Feb 2020; Part 6: 1 May 2020	Part 0: 21 Oct 2019; Part 1: 4 Jun 2018; Part 2a&b: 1 &8 Jul 2019; Part 3: 6 Jan 2020; Part 4: 18 Feb 2020; Part 5a&b: 25 Feb 2020; Part 6: 27 Apr 2020
Language limit:	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are listed below.		
Total number of records retrieved:	Part 0: 249; Part 1: 1188; Part 2: 573; Part 3: 185; Part 4: 12; Part 5a&b: 1&198; Part 6: 7	Part 0: 335; Part 1: 1390; Part 2: 628; Part 3: 159; Part 4: 22; Part 5a&b: 1&426; Part 6: 7	Part 0: 738; Part 1: 2935; Part 2: 993; Part 3: 381; Part 4: 19; Part 5a&b: 4&353; Part 6: 19

Table 4: Overview of the databases used in the literature review (continued)

Data requirement(s) captured in the search	**Details of the searches**			
	8. FSTA	**9. PQSCITECH**	**10. ESBIOBASE**	**11. SCISEARCH**
Justification for choosing the source:	Provides literature on scientific and technological aspects of the processing and manufacture of human food products, e.g. biotechnology, hygiene and toxicology, engineering etc.	Provides a valuable and huge resource of literature (merge of 25 STN databases) from all science areas and technology; from engineering to lifescience.	Provides comprehensive literature on entire spectrum of biological and biosciences research, e.g. microbiology, biotechnology, ecological & environmental sciences, genetics, plant and crop science, toxicology and many more.	Provides one of the largest multidisciplinary scientific literature covering a broad field of sciences, technology, and biomedicine.
Number of records in the database at the time of search:	Part 1: > 1.3 million (06/2017); Part 0, 2, 3, 4, 5a&b, 6: > 1.4 million (07/2018)	Part 1: > 32 million (07/2017); Part 0, 2, 3, 4, 5a&b, 6: > 32 million (07/2017)	Part 1: > 7.2 million (05/2017); Part 0, 2, 3, 4, 5a&b, 6: > 7.6 million (07/2018)	Part 1: > 43 million (08/2017); Part 2: > 45 million (08/2018); Part 0, 3, 4, 5a&b, 6: > 47.7 million (08/2019)
Database update:	Weekly	Monthly	Weekly	Weekly
Date of the search:	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May	Part 0: 28 Oct 2019; Part 1: 8 Jun 2018; Part 2a&b: 8 &10 Jul 2019; Part 3: 7 Jan 2020; Part 4: 24 Feb 2020; Part 5a&b: 27 Feb 2020; Part 6: 4 May
Database covers records:	1969-present	1962-present	1994-present	1974-present
Date of the latest database update:	Part 0: 24 Oct 2019; Part 1: 7 Jun 2018; Part 2a&b: 4 Jul 2019; Part 3: 19 Dec 2019; Part 4, 5a&b: 21 Feb 2020; Part 6: 30 Apr 2020	Part 0: 19 Sep 2019; Part 1: 30 May 2018; Part 2a&b: 4 Jul 2019; Part 3: 17 Dec 2019; Part 4: 31 Jan 2020; Part 5a&b: 26 Feb 2020; Part 6: 28 Apr 2020	Part 0: 23 Oct 2019; Part 1: 7 Jun 2018; Part 2a&b: 3 Jul 2019; Part 3: 7 Jan 2020; Part 4: 19 Feb 2020; Part 5a&b: 26 Feb 2020; Part 6: 29 Apr 2020	Part 0: 22 Oct 2019; Part 1: 4 Jun 2018; Part 2a&b: 1 &8 Jul 2019; Part 3: 30 Dec 2019; Part 4: 21 Feb 2020; Part 5a&b: 25 Feb 2020; Part 6: 27 Apr 2020
Language limit:	No	No	No	No
Document types <u>excluded</u> that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are listed below.			
Total number of records retrieved:	Part 0: 33; Part 1: 176; Part 2: 52; Part 3: 27; Part 4: 1; Part 5a&b: 0&2; Part 6: 2	Part 0: 468; Part 1: 1043; Part 2: 169; Part 3: 100; Part 4: 3; Part 5a&b: 0&72; Part 6: 6	Part 0: 390; Part 1: 1421; Part 2: 566; Part 3: 163; Part 4: 10; Part 5a&b: 1&58; Part 6: 8	Part 0: 815; Part 1: 3236; Part 2: 1155; Part 3: 370; Part 4: 22; Part 5a&b: 1&329; Part 6: 12

Table 5: Total number of articles retrieved for all six searches

	After automatic removal of duplicates within the databases	After applying search filters*	After merge of all six searches and removal of duplicates
Part 0 (Jan 2010 – Dec 2011) glyphosate, AMPA, N-acetyl-AMPA, N-acetyl-glyphosate	**N = 1956**	**N = 1911**	Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print. **N= 11326**
Part 1 (Jan 2012 – Dec 2017) glyphosate, AMPA, N-acetyl-AMPA, N-acetyl-glyphosate	**N = 7123**	**N = 7031**	
Part 2 (Jan 2018 – Jun 2019) glyphosate, AMPA, N-acetyl-AMPA, N-acetyl-glyphosate	**N = 2097**	**N = 2083**	
Part 3 (Jul 2019 – Dec 2019) glyphosate, AMPA, N-acetyl-AMPA, N-acetyl-glyphosate	**N = 1372**	**N = 1364**	
Part 4 (Jan 2010 – Feb 2020) HMPA	**N = 58**	Due to the low number of hits, search filters have not been applied; thus **N = 58**.	
Part 5a (Jan 2010 – Feb 2020) N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA	**N = 4**	Due to the low number of hits, search filters have not been applied, thus **N = 4**.	
Part 5b (Jan 2010 – Feb 2020) methylphosphonic acid	**N = 1051**	**N = 1018**	
Part 6 (Jan 2010 – Apr 2020) N-methylglyphosate	**N = 46**	Due to the low number of hits, search filters have not been applied, thus **N = 46**.	
Total number of hits	**N = 13707**	**N = 13515**	

* Search filters applied for the four technical sections (residues, environmental fate, toxicology and ecotoxicology). Please refer to Chapter 2.3 for more details (page 15).

2.2 Input parameters for the literature search

The basic input parameters used in the literature search, e.g. IUPAC, chemical name or CAS number are provided in Table 6 - Table 15.

Table 6: Input parameters – active substance Glyphosate

Substance name	Glyphosate Salts: isopropylamine, potassium, ammonium, methylmethanamine
IUPAC / CA name	2-(phosphonomethylamino)acetic acid
CAS number(s)	1071-83-6 Salts: 38641-94-0, 70901-12-1, 39600-42-5, 69200-57-3, 34494-04-7, 114370-14-8, 40465-66-5, 69254-40-6

Table 7: Input parameters – metabolite AMPA

Substance name	AMPA
IUPAC / CA name	(aminomethyl)phosphonic acid
CAS number(s)	1066-51-9

Table 8: Input parameters – metabolite N-acetyl glyphosate

Substance name	N-acetyl glyphosate
IUPAC / CA name	N-acetyl-N-(phosphonomethyl)glycine
CAS number(s)	129660-96-4

Table 9: Input parameters – metabolite N-acetyl AMPA

Substance name	N-acetyl AMPA
IUPAC / CA name	[(acetylamino)methyl]phosphonic acid
CAS number(s)	57637-97-5

Table 10: Input parameters – metabolite HMPA

Substance name	HMPA
IUPAC / CA name	(hydroxymethyl)phosphonic acid
CAS number(s)	2617-47-2

Table 11: Input parameters – metabolite N-methyl AMPA

Substance name	N-methyl AMPA
IUPAC / CA name	[(methylamino)methyl]phosphonic acid
CAS number(s)	35404-71-8

Table 12: Input parameters – metabolite N-glyceryl AMPA

Substance name	N-glyceryl AMPA
IUPAC / CA name	(2,3-dihydroxypropanoylamino)methylphosphonic acid
CAS number(s)	No data

Table 13: Input parameters – metabolite N-malonyl AMPA

Substance name	N-malonyl AMPA
IUPAC / CA name	3-oxo-3-(phosphonomethylamino)propanoic acid
CAS number(s)	no data

Table 14: Input parameters – metabolite methylphosphonic acid

Substance name	methylphosphonic acid
IUPAC / CA name	methylphosphonic acid
CAS number(s)	993-13-5

Table 15: Input parameters – metabolite N-methylglyphosate

Substance name	N-methylglyphosate
IUPAC / CA name	2-[methyl(phosphonomethyl)amino]acetic acid
CAS number(s)	24569-83-3

2.3 Endpoint specific search terms

The approach used for the searches was either the "single concept search"[6] (in searches Part 4, 5a and 6) or the "focused search for grouped data requirements"[7] (in searches Part 0, 1, 2, 3, 5b), which combines the active substance / metabolites keywords with the search filters used in the technical sections. Please refer to Table 16 for more details on the keywords used and to Table 17 - Table 20 for the search filters.

Table 16: Keywords used for the active substance glyphosate and its metabolites

Gly1: Glyphosate and AMPA	glyphosat? OR glifosat? OR glyfosat? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR 69254-40-6 OR aminomethyl phosphonic OR aminomethylphosphonic OR 1066-51-9
Gly2: N-acetyl glyphosate and N-acetyl AMPA	2 acetyl phosphonomethyl amino acetic acid OR n acetyl glyphosate OR n acetylglyphosate OR n acetyl n phosphonomethyl glycine OR 129660-96-4 OR n acetyl ampa OR acetylamino methyl phosphonic acid OR acetylaminomethyl phosphonic acid OR 57637-97-5
HMPA	2617-47-2 OR hydroxymethanephosphonic acid OR hydroxymethyl phosphonate OR hydroxymethylphosphonate OR hydroxymethyl phosphonic acid OR hydroxymethylphosphonic acid OR methanehydroxyphosphonic acid OR phosphonic acid(1w)hydroxymethyl OR phosphonomethanol
N-methyl AMPA	35404-71-8 OR methylamino methyl phosphonic acid OR methylaminomethyl phosphonic acid OR methylaminomethylphosphonic acid OR n methyl ampa OR nsc 244826 OR phosphonic acid methylamino methyl OR phosphonic acid p methylamino methyl
N-glyceryl AMPA	2 3 dihydroxy 1 oxopropyl aminomethyl phosphonic acid OR 2 3 dihydroxy 1 oxopropyl aminomethylphosphonic acid OR n glyceryl ampa
N-malonyl AMPA	3 oxo 3 phosphonomethyl amino propanoic acid or 3 oxo 3 phosphonomethyl aminopropanoic acid or n malonyl ampa
methylphosphonic acid	993-13-5 OR dihydrogen methylphosphonate OR methanephosphonic acid OR methyl phosphonic acid OR methylphosphonic acid OR nsc 119358 OR phosphonic acid methyl OR phosphonic acid p methyl
N-methylglyphosate (NMG)	24569-83-3 OR 2 methyl phosphonomethyl amino acetic acid OR 2 methyl phosphonomethyl aminoacetic acid OR acetic acid 2 n methyl n phosphonatomethyl amino OR glycine n methyl n phosphonomethyl OR glyphosate n methyl OR methyl glyphosate OR methyl phosphonomethyl amino acetic acid OR methyl phosphonomethyl aminoacetic acid OR n methyl n phosphonomethyl glycine OR n methylglyphosate OR n phosphonomethyl n methyl glycine OR n phosphonomethyl n methylglycine

(1w) = proximity operator (this order, up to 1 word between)

[6] Definition by the EFSA GD document: single concept search = using the active substance names and its synonyms.
[7] Citation from the EFSA GD: *If the number of summary records returned by a single concept search is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

Table 17: Search filters related to the technical section toxicology

Toxicology Gly1 OR Gly2 AND the following search filters; methyl phosphonic acid AND the following search filters
tox? OR hazard? OR adverse OR health OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR in vivo OR in vitro OR invivo OR invitro OR mode of action OR skin? OR eye? OR irrit? OR sensi? OR allerg? OR rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR metabolism OR metabolite? OR metabolic OR distribution OR adsorption OR excretion OR elimination OR kinetic OR cytochrome OR enzym? OR gen? OR muta? OR chromos? OR clastogen? OR DNA OR carcino? OR cancer? OR tumor? OR tumour? OR oncog? OR oncol? OR malign? OR immun? OR neur? OR endocrin? OR hormon? OR gonad? OR disrupt? OR reproduct? OR development? OR malform? OR anomal? OR fertil? OR foet? OR fet? OR matern? OR pregnan? OR embryo? OR epidem? OR medical? OR poison? OR exposure OR operator? OR bystander? OR resident? OR worker? OR occupat? biomonitoring OR human exposure OR microbiome OR oxidative stress OR apoptosis OR necrosis OR cytotoxicity OR Polyoxyethyleneamine OR POEA OR surfactant OR risk assessment?

Table 18: Search filters related to the technical section residues

Residues Gly1 OR Gly2 AND the following search filters; methyl phosphonic acid AND the following search filters
uptake OR translocation OR rumen OR storage stability OR storage OR stability OR metabolic OR metabolism OR breakdown OR nature of residues OR residue? OR magnitude of residues OR process? OR effects of processing OR dessicant OR preharvest OR preemerg? OR ?resistant? OR ?toleran? OR transgenic OR hydroly? OR rotation? OR succeed? OR plant? OR crop? OR feed? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig? OR dietary OR assessment OR risk assessment OR consum? OR exposure

Table 19: Search filters related to the technical section environmental fate

Environmental fate Gly1 OR Gly 2 AND the following search filters; methyl phosphonic acid AND the following search filters
soil OR water OR sediment OR degradat? OR photo? OR soil residues OR soil accumulat? OR soil contaminat? OR mobility OR sorption OR column leaching OR aged residue OR leach? OR lysimeter OR groundwater OR contaminat? OR microb? OR exudation OR rhizosphere OR dissipation OR saturated zone OR hydrolysis OR drift OR run-off OR runoff OR drainage OR volat? OR atmosphere OR long-range transport OR short-range transport OR transport OR micronutrient OR phosphate OR iron OR manganese OR half-life OR halflife OR half-lives OR halflives OR DT50 OR kinetics OR off-site movement OR removal OR drinking water OR water treatment processes OR atmospheric deposition OR tile-drains OR surface water OR monitoring data OR disinfectant OR ozone OR tillage OR infiltration OR hard surface OR rainwater OR rain water OR chelat? OR complex? OR mineralization OR persistence OR ligand

Table 20: Search filters related to the technical section ecotoxicology

Ecotoxicology Gly1 or Gly 2 AND the following search filters; methyl phosphonic acid AND the following search filters
tox? OR ecotox? OR ?toxic OR ?toxicity OR hazard OR adverse OR endocrine disrupt? OR bioaccumulate? OR biomagnifi? OR bioconcentration OR poison OR effect OR indirect effect? OR direct effect? OR biodivers? OR protection goals OR eco? OR impact OR population OR OR community OR wildlife OR incident OR wildlife OR incident OR pest OR bird? OR acute OR chronic OR long-term OR mallard OR duck OR quail OR bobwhite OR Anas? OR Colinus? OR wild OR dietary OR aquatic OR fish OR daphni? OR alg? OR chiron? OR sediment dwell? OR benthic OR lemna OR marin? OR estuarine OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR plant AND submerge? OR emerge? OR bee? OR apis OR apidae OR bumble? OR colony OR hive OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR protection OR model? OR vole OR pest OR arthropod? OR beneficials OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR decompos? OR micro organisms OR microorganisms OR microbial OR carbon OR nitrogen OR plant? OR vegetative vigo? OR seedling OR germination OR monocot? OR dicot? OR sewage OR activated sludge OR biodegrad? OR bioaccumulation? OR amphib? OR reptile? OR aquatic plant OR beneficial

2.4 Relevance assessment

After combination of all six searches and removal of duplicates, the remaining articles were assessed for their relevance at title / abstract level (so-called rapid assessment, see 2.4.1 and 2.4.3). Articles that were identified as "non-relevant" in the rapid assessment were excluded from further evaluation. For articles that were not excluded in the rapid assessment, full-text documents were reviewed (detailed assessment, see 2.4.2 and 2.4.3).

2.4.1 Relevance assessment at "title / abstract" level

2.4.1.1 Criteria applied for "non-relevance" at "title / abstract" level

Articles identified as "non-relevant" in the rapid assessment belong to one of the following categories. These articles were excluded from further evaluation.

- Publications related to efficacy (resistance related articles, new uses of control of pest/crops) or to agricultural / biological research (crop science, breeding, fertilization, tillage, fundamental plant physiology / micro / molecular biology).
- Publications dealing with analytical methods / development.
- Publications describing new methods of synthesis (discovery / developments) or other aspects of basic (organic / inorganic) chemistry.
- Patents.
- Wastewater treatment.
- Abstracts referring to a conference contribution that does not contain sufficient data / information for risk assessment.
- Publications focusing on genetically modified organisms / transgenic crops; no data directly relevant to glyphosate evaluation (e.g. crop compositional analysis, gene flow, protein characterization).
- Publications where glyphosate or a relevant metabolite were not the focus of the paper.
- Secondary information including scientific and regulatory reviews[8].
- Articles dealing with political / socio / economic analysis.
- Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity).
- Study design, test system, species tested, exposure routes etc. are not relevant for the European regulatory purposes.
- Findings not related to ecotoxicology, toxicology, metabolism, environmental fate.
- Publications not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).

[8] Reviews have been partly evaluated on full text level as well – case by case decision.

2.4.2 Relevance assessment at "full-text" level

For articles that were not excluded in the rapid assessment, full-text documents have been reviewed (detailed assessment).

2.4.2.1 Criteria applied for "non-relevance" at "full-text" level

Articles that have been identified as "non-relevant" in the detailed assessment belong to one of the following categories:

- Publications dealing with a Roundup formulation that is <u>not</u> the representative formulation for the AIR5 dossier in Europe.
- Publications dealing with general pesticide exposures (not glyphosate specific).
- The presented endpoints are not relatable to the EU level risk assessment.
- Opinion articles where no new data is provided that can be used for risk assessment.
- Findings based on cellular and molecular level that cannot be related to the risk assessment.
- Criteria outlined in Section 2.4.1.1, that needed the full text document to determine.

2.4.3 Selection and review processs for articles on the health and exposure of glyphosate

The scientific literature on the health effects of glyphosate can be subdivided in two main parts:

- Articles containing data on glyphosate acid and salts and on the reference glyphosate formulation MON 52276, and
- Articles only containing data on glyphosate formulations and/or co-formulants that have a composition different from that of the reference formulation MON 52276.

In the case of articles only relating to glyphosate formulations *in vitro* testing with the exception of cell/tissue systems[9] that are likely to come in direct contact with formulations and glyphosate formulations containing other active ingredients are excluded. The reason for the exclusion of *in vitro* testing of formulations to assess health effects as a result of systemic exposure is the presence of surfactants which produce cell toxicity based on the destabilization of the cell membrane and the mitochondrial membrane thus masking the specific toxicity of glyphosate. The toxicity of the co-formulants in combination with glyphosate is dependent on the concentration and the nature of the co-formulants and can be addressed on a case-by-case basis during the registration process of specific formulations.

In the relevance of glyphosate data, those articles have been considered as not relevant (and reliable) for the assessment for systemic toxicity when only *in vitro* results are presented with glyphosate concentrations beyond 1 mM. This is because it is physiologically not possible to attain such concentrations in standard regulatory *in vivo* testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in *in vivo* test systems. It thus makes no sense to include such data in the risk assessment of glyphosate. Exceptions can be made in the event of direct contact with formulations resulting in localized effects, but then there is the contribution of the toxicity of the co-formulants which can be better addressed in the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

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[9] Glyphosate-based herbicides (GBH) contain surfactants that destabilize the cell membrane and the mitochondrial membrane and thus produce a toxicity that is not representative for glyphosate (see Levine S. L. et al, *Cell Biol. Toxicol. (2007) 23:385-400*). This has been clearly demonstrated in the scientific literature and also in some papers reviewed for this submission where in vitro glyphosate toxicity is compared against that of GBH and surfactants.

The limit of 1 mM has been based on the single dose oral pharmacokinetic data of a formulation containing 71.7% w/w glyphosate where an oral dose of 1,430 mg/kg bw in the rat gives plasma levels of 38.1 µg/mL or 0.225 mM after 2 hours. When extrapolated linearly (which is possible for glyphosate because it is not subject to hepatic metabolism) this gives plasma levels of 53.3 µg/mL or 0.315 mM at 2 hours after oral intake of 2,000 mg/kg bw and 107 µg/mL or 0.630 mM at 2 hours after oral intake of 4,000 mg/kg bw. A systemic concentration of glyphosate of 1 mM would then represent an oral dose of more than 6,000 mg/kg bw which is completely unreasonable for repeat dose experimental *in vivo* testing under today's OECD test guidelines. The ADI for glyphosate of 0.5 mg/kg bw/day corresponds with a daily systemic concentration of 0.17 µg/mL or 1 µM when a 60 kg person with 36 L extracellular fluid is considered with a glyphosate oral bioavailability of 20%. The daily systemic dose of glyphosate on the day of application (i.e. highest exposure day), based on the geometric mean of 3.2 µg/L in urine, of glyphosate applicators in the US is approx. 0.0001 mg/kg bw/day (Acquavella, 2004[10]) which is 1000 times less than the systemic dose (0.1 mg/kg bw) corresponding with the ADI oral dose of 0.5 mg/kg bw with 20% oral bioavailability.

Many articles that have been considered relevant for the risk assessment of glyphosate and have been assessed for reliability on full text basis contain experimental data as well on glyphosate as such as on formulations (different from MON 52276) and co-formulants. In such case only the toxicology data pertinent to glyphosate and to the reference formulation (if that can be clearly stated by the author of the article) are summarized and discussed. In the case of articles on exposure monitoring and epidemiology, exposure to glyphosate formulations are considered.

2.4.4 Categorization of "relevant" articles at full text level

Articles that have been identified as "relevant" in the rapid assessment have been categorized as recommended in the EFSA GD 2011; 9(2):2092, Point 5.4.1.

Category (a) Studies that provide data for establishing or refining risk assessment parameters. These studies should be summarised in detail following the subsequent steps of the OECD Guidance documents (OECD, 2005; 2006) and should be considered for reliability.

Category (b) Studies that are relevant to the data requirement, but in the opinion of the applicant provide only supplementary information that does not alter existing risk assessment parameters. After expert judgement, essential reliability parameters affect the full reliability of the study. A justification for such a decision should be provided.

Category (c) Studies for which relevance cannot be clearly determined. For each of these studies the applicants should provide an explanation of why the relevance of such studies could not be definitively determined.

The list of category A articles can be found in Table 32 and Table 33. The list of category B articles and the justifications can be found in Table 34 and Table 35. The list of category C articles and the explanations can be found in Table 36 and Table 37.

[10] Acquavella J. F. et al. (2004), Environmental Health Perspectives, 112(3), 321-326.

2.5 Reliability assessment

For articles, which have been identified as category A, under the Point 5.4.1 of the EFSA GD document, a reliability assessment has been performed. The reliability criteria for each technical section are summarized in Table 21 - Table 23.

For articles (category A) that have been identified as reliable or reliable with restrictions, summaries have been compiled. These summaries are presented in the MCA / MCP parts of the respective dossier section.
Articles of category A which have been identified as non-reliable were downgraded to articles of category B (relevant but supplementary).

Table 21: Reliability criteria for ecotoxicology, environmental fate and residues

Applied for	Reliability criteria
Ecotoxicology, Environmental Fate, Residues	For guideline-compliant studies (GLP studies): OECD, OPPTS, ISO, and others. The validity/quality criteria listed in the corresponding guidelines are met.
Ecotoxicology, Environmental Fate, Residues	(No) previous exposure to other chemicals is documented (where relevant).
Ecotoxicology	For aquatic studies, the test substance is dissolved in water or where a carrier is required, it is appropriate (non-toxic) and a carrier control / positive control is considered in the test design.
Environmental Fate, Residues	The test substance is dissolved in water or non-toxic solvent.
Ecotoxicology, Environmental Fate, Residues	Test item is sufficiently documented, and reported (i.e. purity, source, content, storage conditions).
Ecotoxicology	For tests including vertebrates, compliance of the batches used in toxicity studies compared to the technical specification.
Ecotoxicology	Species used in the experiment are clearly reported, including source, experimental conditions (where relevant): strain, adequate age/life stage, body weight, acclimatization, temperature, pH, oxygen (dissolved oxygen for aquatic tests) content, housing, light conditions, humidity (terrestrial species) incubation conditions, feeding.
Ecotoxicology	The validity criteria from relevant test guidelines can be extrapolated across different species but not necessarily across different test designs. If different, then the nature of the difference and impact should ideally be discussed.
Ecotoxicology, Environmental Fate, Residues	Only glyphosate or its metabolites is the test substance (excluding mixture), and information on application of the test substance is described.
Ecotoxicology, Environmental Fate, Residues	The endpoint measured can be considered a consequence of glyphosate (or a glyphosate metabolite).
Ecotoxicology, Environmental Fate, Residues	Study design / test system is well described, including when relevant: concentration in exposure media (dose rates, volume applied, etc.), dilution/mixture of test item (solvent, vehicle) where relevant.
Ecotoxicology, Environmental Fate, Residues	Analytical verifications performed in test media (concentration) / collected samples, stability of the test substance in test medium should be documented.
Ecotoxicology	The test has been performed in several dose levels (at least 3) including a positive / negative control where relevant.
Ecotoxicology	Suitable exposure throughout the whole exposure period was demonstrated and reported.
Ecotoxicology	A clear concentration response relationship is reported – in studies where the dose response test design is employed.
Ecotoxicology	A sufficient number of animals per group to facilitate statistical analysis reported: mortality in control groups reported, observations/findings in positive/negative control clearly reported (where relevant).
Ecotoxicology, Environmental Fate, Residues	Assessment of the statistical power of the assay is possible with reported data.
Ecotoxicology, Environmental Fate, Residues	Statistical methodology is reported (e.g., checking the plots and confidence intervals).

Applied for	Reliability criteria
Ecotoxicology	Description of the observations (including time-points), examinations, and analyses performed, with (where relevant) dissections being well documented.
Ecotoxicology	For terrestrial ecotoxicological studies in the laboratory or the field, the substrates used should be adequately described e.g. nature of substrate i.e. species of leaf or soil type.
Ecotoxicology, Environmental Fate, Residues	Field locations relevant / comparable to European conditions.
Ecotoxicology, Environmental Fate, Residues	Characterization of soil: texture (sandy loam, silty loam, loam, loamy sand), pH (5.5-8.0), cation exchange capacity, organic carbon (0.5-2-5%), bulk density, water retention, microbial biomass (~1% of organic carbon).
Ecotoxicology, Environmental Fate	Other soils where information on characterization by the parameters: pH, texture, CEC, organic carbon, bulk density, water holding capacity, microbial biomass.
Ecotoxicology, Environmental Fate, Residues	For tests including agricultural soils, they should not have been treated with test substance or similar substances for a minimum of 1 year.
Ecotoxicology, Environmental Fate	For soil samples, sampling from A-horizon, top 20 cm layers; soils freshly from field preferred (storage max 3 months at 4 +/- 2°C).
Ecotoxicology, Environmental Fate, Residues	Data on precipitation is recorded.
Environmental Fate	The temperature was in the range between 20-25°C and the moisture was reported.
Environmental Fate	The presence of glyphosate identified in samples were collected from European groundwater, soil, surface waters, sediments or air.
Ecotoxicology	For lab terrestrial studies, the temperature was appropriate to the species being tested and generally should fall within the range between 20-25°C and soil moisture / relative humidity was reported.
Ecotoxicology	For bee studies, temperature of the study should be appropriate to species.
Ecotoxicology	For lab aquatic studies:
	The source and / or composition of the media used should be described.
	The temperature of the water should be appropriate to the species being tested and generally fall within the 15-25ºC.
Ecotoxicology, Residues	The residue data can be linked to a clearly described GAP table, appropriate in the context of the renewal of approval of glyphosate (crop, application method, doses, intervals, PHI).
Ecotoxicology, Environmental Fate, Residues	Analytical results present residues measurements which can be correlated with the existing residues definition of glyphosate, and where relevant its metabolites.
Ecotoxicology, Environmental Fate, Residues	Analytical methods are clearly described; and adequate statement of specificity and sensitivity of the analytical methods is included.
Ecotoxicology	Assessment of the ECX for the width of the confidence interval around the median value; and the certainty on the level of protection offered by the median ECX is reported.
Environmental Fate	Radiolabel characterization: purity, specific activity, location of label is reported.
Environmental Fate	If degradation kinetics are included: data tables / model description / statistical parameters for kinetic fit to be provided.
Environmental Fate, Residues	Monitoring data: description of matrix analysed, and analytical methods to be fully described.
Environmental Fate	Clear description of application rate and relevance to approved uses.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 22: Reliability criteria for toxicology – epidemiology and exposure studies

Reliability criteria – toxicology	
Epidemiology studies	**Exposure studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines/practices	Study in accordance to valid internationally accepted testing guidelines/practices
Study completely described and conducted following scientifically acceptable standards	Study performed according to GLP
	Study completely described and conducted following scientifically acceptable standards
Test substance	**Test substance**
Exposure to formulations with only glyphosate as a.i.	Exposure to formulations with only glyphosate as a.i.
Exposure to formulations with glyphosate combined with other a.i.	Exposure to formulations with glyphosate combined with other a.i.
Exposure to various formulations of pesticides	Exposure to various formulations of pesticides
Study	**Study**
Study design – epidemiological method followed	Study design clearly described
Description of population investigated	Population investigated sufficiently described
Description of exposure circumstances	Exposure circumstances sufficiently described
Description of results	Sampling scheme sufficiently documented
Have confounding factors been considered	Analytical method described in detail
Statistical analysis	Validation of analytical method reported
	Monitoring results reported
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 23: Reliability criteria for toxicology – *in vitro* and *in vivo* studies

Reliability criteria – toxicology and metabolism	
***In vitro* studies**	***In vivo* studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines	Study in accordance to valid internationally accepted testing guidelines.
Study performed according to GLP	Study performed according to GLP
Study completely described and conducted following scientifically acceptable standards	Study completely described and conducted following scientifically acceptable standards
Test substance	**Test substance**
Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions)	Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions)
Only glyphosate acid or one of its salts is the tested substance	Only glyphosate acid or one of its salts is the tested substance
AMPA is the tested substance	AMPA is the tested substance
Study	**Study**
Test system clearly and completely described	Test species clearly and completely described
Test conditions clearly and completely described	Test conditions clearly and completely described
Metabolic activation system clearly and completely described	Route and mode of administration described
Test concentrations in physiologically acceptable range (< 1 mM)	Dose levels reported
Cytotoxicity tests reported	Number of animals used per dose level reported
Positive and negative controls	Method of analysis described for analysis test media
Complete reporting of effects observed	Validation of the analytical method
Statistical methods described	Analytical verifications of test media
Historical negative and positive control data reported	Complete reporting of effects observed
Dose-effect relationship reported	Statistical methods described
	Historical control data of the laboratory reported
	Dose-effect relationship reported
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

3 SEARCH RESULTS

The full outcome of the literature search is provided below.

Table 24: Summary of the literature review – all technical sections

	Number	Justification
Total number of articles retrieved from all searches. [a]	39482	n.a.
Total number of articles after removal of duplicates within all databases.	13707	n.a.
Total number of articles after merge of all searches [a] and removal of duplicates. [b]	11326	n.a.
Number of articles excluded after rapid assessment (title / abstract).	9784	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	1542	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	852	See Table 38
Number of articles not excluded after detailed assessment. [c]	690	See Table 32-Table 37
Number of summaries presented in the dossier. [d]	178+1 [e]	See Table 32, Table 33

[a] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.

[b] Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[c] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).

[d] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

[e] One e-fate entry (+1) is an erratum to the respective article; no summary was compiled for the erratum, however to keep the statistics clear, the erratum is also mentioned here.

Table 25: Results of the article selection process for ecotoxicology

	Number	Justification
Total number of records after merge of all searches [a] and removal of duplicates.	1464	n.a.
Number of articles excluded after rapid assessment (title / abstract).	918	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	546	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	398	See Table 38
Number of articles not excluded after detailed assessment. [b]	148	See Table 32-Table 37
Number of summaries presented in the dossier. [c]	10	See Table 32, Table 33

[a] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.

[b] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).

[c] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

Table 26: Results of the article selection process for environmental fate

	Number	Justification
Total number of records after merge of all searches [a)] and removal of duplicates.	1062	n.a.
Number of articles excluded after rapid assessment (title / abstract).	759	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	303	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	132	See Table 38
Number of articles not excluded after detailed assessment. [b)]	171	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	97+1 [d)]	See Table 32, Table 33

[a)] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.

[b)] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).

[c)] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

[d)] One e-fate entry (+1) is an erratum to the respective article; no summary was compiled for the erratum, however to keep the statistics clear, the erratum is also mentioned here.

Table 27: Results of the article selection process for residues

	Number	Justification
Total number of records after merge of all searches [a)] and removal of duplicates.	475	n.a.
Number of articles excluded after rapid assessment (title / abstract).	405	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	70	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	30	See Table 38
Number of articles not excluded after detailed assessment. [b)]	40	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	11	See Table 32, Table 33

[a)] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.

[b)] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).

[c)] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

Table 28: Results of the article selection process for toxicology

	Number	Justification
Total number of records after merge of all searches [a)] and removal of duplicates.	1454	n.a.
Number of articles excluded after rapid assessment (title / abstract).	831	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	623	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	292	See Table 38
Number of articles not excluded after detailed assessment. [b)]	331	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	60	See Table 32, Table 33

[a)] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.

[b)] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).

[c)] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

Table 29: Results of the article selection process for analytical methods

	Number	Justification
Total number of records after merge of all searches [a] and removal of duplicates.	117	n.a.
Number of articles excluded after rapid assessment (title / abstract).	117	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b]	n.a.	n.a.
Number of summaries presented in the dossier. [c]	n.a.	n.a.

[a] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.
[b] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).
[c] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

Table 30: Results of the article selection process for efficacy / agronomy

	Number	Justification
Total number of records after merge of all searches [a] and removal of duplicates.	4324	n.a.
Number of articles excluded after rapid assessment (title / abstract).	4324	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b]	n.a.	n.a.
Number of summaries presented in the dossier. [c]	n.a.	n.a.

[a] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.
[b] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).
[c] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

Table 31: Results of the article selection process for “others” (e.g. synthesis, chemistry etc.)

	Number	Justification
Total number of records after merge of all searches [a] and removal of duplicates.	2430	n.a.
Number of articles excluded after rapid assessment (title / abstract).	2430	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b]	n.a.	n.a.
Number of summaries presented in the dossier. [c]	n.a.	n.a.

[a] After all searches: Part 0, 1, 2, 3, 4, 5a&b, 6.
[b] All articles belonging to the category A, B, C of the Point 5.4.1 (as stated in the EFSA GD document).
[c] Summaries presented in the dossier: articles classified as relevant (EFSA GD, Point 5.4.1, category A) & reliable or relevant (EFSA GD, Point 5.4.1, category A) & reliable with restrictions.

Table 32: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by data requirement(s)

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
49	CA 5.3	Gao H. et al.	2019	Activation of the N-methyl-d-aspartate receptor is involved in glyphosate-induced renal proximal tubule cell apoptosis.	Journal of applied toxicology (2019), Vol. 39, pp. 1096	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
78	CA 5.3	Kumar S. et al.	2014	Glyphosate-rich air samples induce IL-33, TSLP and generate IL-13 dependent airway inflammation.	Toxicology (2014), Vol. 325, pp. 42	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
100	CA 5.3	Mesnage R. et al.	2018	Comparison of transcriptome responses to glyphosate, isoxaflutole, quizalofop-p-ethyl and mesotrione in the HepaRG cell line.	Toxicology reports (2018), Vol. 5, pp. 819	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
104	CA 5.3	Milic M. et al.	2018	Oxidative stress, cholinesterase activity, and DNA damage in the liver, whole blood, and plasma of Wistar rats following a 28-day exposure to glyphosate.	Arhiv za higijenu rada i toksikologiju (2018), Vol. 69, No. 2, pp. 154	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
157	CA 5.3	Tang J. et al.	2017	Ion Imbalance Is Involved in the Mechanisms of Liver Oxidative Damage in Rats Exposed to Glyphosate.	Frontiers in physiology (2017), Vol. 8, pp. 1083	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
1	CA 5.4	Adler-Flindt S. et al.	2019	Comparative cytotoxicity of plant protection products and their active ingredients.	Toxicology In Vitro, (2019) Vol. 54, pp. 354	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
31	CA 5.4	da Silva Natara D. G. et al.	2019	Interference of goethite in the effects of glyphosate and Roundup® on ZFL cell line.	Toxicology in vitro (2020), Vol. 65, pp. 104755	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
37	CA 5.4	de Almeida, L. K. S. et al.	2018	Moderate levels of glyphosate and its formulations vary in their cytotoxicity and genotoxicity in a whole blood model and in human cell lines with different estrogen receptor status.	3 Biotech (2018), Vol. 8, No. 10, pp. 438	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
64	CA 5.4	Ilyushina N. A. et al.	2018	Comparative investigation of genotoxic activity of glyphosate technical products in the micronucleus test in vivo.	Toksikologicheskii Vestnik (2018), No. 4, pp. 24	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
65	CA 5.4	Ilyushina N. A. et al.	2019	Maximum tolerated doses and erythropoiesis effects in the mouse bone marrow by 79 pesticides' technical materials assessed with the micronucleus assay.	Toxicology Reports (2019), Vol. 6, pp. 105	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
73	CA 5.4	Kasuba V. et al.	2017	Effects of low doses of glyphosate on DNA damage, cell proliferation and oxidative stress in the HepG2 cell line.	Environmental science and pollution research international (2017), Vol. 24, No. 23, pp. 19267	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
76	CA 5.4	Koller V. J. et al.	2012	Cytotoxic and DNA-damaging properties of glyphosate and Roundup in human-derived buccal epithelial cells.	Archives of toxicology (2012), Vol. 86, No. 5, pp. 805	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
79	CA 5.4	Kwiatkowska M. et al.	2017	DNA damage and methylation induced by glyphosate in peripheral blood mononuclear cells (in vitro study)	Food and chemical toxicology (2017), Vol. 105, pp. 93	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
91	CA 5.4	Manas F. et al.	2013	Oxidative stress and comet assay in tissues of mice administered glyphosate and ampa in drinking water for 14 days.	Journal of Basic and Applied Genetics (2013), Vol. 24, No. 2, pp. 67	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
110	CA 5.4	Nagy K. et al.	2019	Comparative cyto- and genotoxicity assessment of glyphosate and glyphosate-based herbicides in human peripheral white blood cells.	Environmental research (2019), Vol. 179, No. Pt B, pp. 108851	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
131	CA 5.4	Roustan A. et al.	2014	Genotoxicity of mixtures of glyphosate and atrazine and their environmental transformation products before and after photoactivation.	Chemosphere (2014), Vol. 108, pp. 93	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
138	CA 5.4	Santovito A. et al.	2018	In vitro evaluation of genomic damage induced by glyphosate on human lymphocytes.	Environmental science and pollution research international (2018), Vol. 25, No. 34, pp. 34693	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
152	CA 5.4	Suarez-Larios K. et al.	2017	Screening of Pesticides with the Potential of Inducing DSB and Successive Recombinational Repair.	Journal of Toxicology (2017), Article ID 3574840	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
165	CA 5.4	Townsend M. et al.	2017	Evaluation of various glyphosate concentrations on DNA damage in human Raji cells and its impact on cytotoxicity.	Regulatory toxicology and pharmacology (2017), Vol. 85, pp. 79	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
6	CA 5.5	Andreotti G. et al.	2018	Glyphosate Use and Cancer Incidence in the Agricultural Health Study	Journal of the national cancer institute (2018) Vol. 110, No. 5, pp. 509	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
14	CA 5.5	Biserni M. et al.	2019	Quizalofop-p-Ethyl Induces Adipogenesis in 3T3-L1 Adipocytes.	Toxicological sciences (2019), Vol. 1, No. 170, pp. 452	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
30	CA 5.5	Crump K.	2020	The Potential Effects of Recall Bias and Selection Bias on the Epidemiological Evidence for the Carcinogenicity of Glyphosate.	Risk analysis (2020), Vol. 40, pp. 696	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
44	CA 5.5	Duforestel M. et al.	2019	Glyphosate Primes Mammary Cells for Tumorigenesis by Reprogramming the Epigenome in a TET3-Dependent Manner.	Frontiers in genetics (2019), Vol. 10, pp. 885	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
116	CA 5.5	Pahwa M. et al.	2019	Glyphosate use and associations with non-Hodgkin lymphoma major histological sub-types: findings from the North American Pooled Project.	Scandinavian journal of work, environment & health (2019), Vol. 1; No. 45, pp. 600	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
123	CA 5.5	Presutti R. et al.	2016	Pesticide exposures and the risk of multiple myeloma in men: An analysis of the North American Pooled Project.	International Journal of Cancer (2016), Vol. 139, No. 8, pp. 1703	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
149	CA 5.5	Sorahan T.	2015	Multiple myeloma and glyphosate use: a re-analysis of US Agricultural Health Study (AHS) data.	International journal of environmental research and public health (2015), Vol. 12, No. 2, pp. 1548	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
173	CA 5.5	Wang L. et al.	2019	Glyphosate induces benign monoclonal gammopathy and promotes multiple myeloma progression in mice.	Journal of hematology & oncology, (2019), Vol. 12, No. 1, pp. 70	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
175	CA 5.5	Wozniak E. et al.	2019	Glyphosate affects methylation in the promoter regions of selected tumor suppressors as well as expression of major cell cycle and apoptosis drivers in PBMCs (in vitro study).	Toxicology in vitro (2019), Vol. 63, pp. 104736	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
33	CA 5.6	Dai P. et al.	2016	Effect of glyphosate on reproductive organs in male rat.	Acta histochemica (2016), Vol. 118, No. 5, pp. 51	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
46	CA 5.6	Forgacs A. L. et al.	2012	BLTK1 murine Leydig cells: a novel steroidogenic model for evaluating the effects of reproductive and developmental toxicants.	Toxicological sciences (2012), Vol. 127, No. 2, pp. 391	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
56	CA 5.6	Gorga A. et al.	2020	In vitro effects of glyphosate and Roundup on Sertoli cell physiology.	Toxicology in vitro (2020), Vol. 62, pp. 104682	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
69	CA 5.6	Johansson H. et al.	2018	Exposure to a glyphosate-based herbicide formulation, but not glyphosate alone, has only minor effects on adult rat testis.	Reproductive toxicology (2018), Vol. 82, pp. 25	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
93	CA 5.6	Manservisi F. et al.	2019	The Ramazzini Institute 13-week pilot study glyphosate-based herbicides administered at human-equivalent dose to Sprague Dawley rats: effects on development and endocrine system.	Environmental health (2019), Vol. 18, No. 1, pp. 15	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
117	CA 5.6	Panzacchi S. et al.	2018	The Ramazzini Institute 13-week study on glyphosate-based herbicides at humanequivalent dose in Sprague Dawley rats: study design and first in-life endpoints evaluation	Environmental Health (2018), Vol. 17, pp. 52/1	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
119	CA 5.6	Perego M. C. et al.	2017	Evidence for direct effects of glyphosate on ovarian function: glyphosate influences steroidogenesis and proliferation of bovine granulosa but not theca cells in vitro.	Journal of applied toxicology (2017), Vol. 37, No. 6, pp. 692	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
121	CA 5.6	Pham Thu H. et al.	2019	Perinatal Exposure to Glyphosate and a Glyphosate-Based Herbicide Affect Spermatogenesis in Mice.	Toxicological sciences (2019), Vol. 169, No. 1, pp. 260	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
128	CA 5.6	Ren Xin et al.	2019	Effects of chronic glyphosate exposure to pregnant mice on hepatic lipid metabolism in offspring.	Environmental pollution (2019), Vol. 254, No. Pt A, pp. 112906	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
177	CA 5.6	Zhang J. et al.	2019	The toxic effects and possible mechanisms of glyphosate on mouse oocytes.	Chemosphere (2019), Vol. 237, pp. 124435	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
22	CA 5.7	Chorfa A. et al.	2013	Specific pesticide-dependent increases in α-synuclein levels in human neuroblastoma (SH-SY5Y) and melanoma (SK-MEL-2) cell lines.	Toxicological sciences (2013), Vol. 133, No. 2, pp. 289	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
95	CA 5.7	Martinez A. et al.	2019	Effects of glyphosate and aminomethylphosphonic acid on an isogeneic model of the human blood-brain barrier.	Toxicology letters (2019), Vol. 304, pp. 39	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
96	CA 5.7	Martinez M. A. et al.	2018	Neurotransmitter changes in rat brain regions following glyphosate exposure.	Environmental research (2018), Vol. 161, pp. 212	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
101	CA 5.8	Mesnage R. et al.	2018	Ignoring Adjuvant Toxicity Falsifies the Safety Profile of Commercial Pesticides.	Frontiers in Public Health (2018), Vol. 5, pp. 361	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
169	CA 5.8	Vanlaeys A. et al.	2018	Formulants of glyphosate-based herbicides have more deleterious impact than glyphosate on TM4 Sertoli cells.	Toxicology in vitro (2018), Vol. 52, pp. 14.	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
60	CA 5.8.1	Hao Y. et al.	2019	Roundup-Induced AMPK/mTOR-Mediated Autophagy in Human A549 Cells.	Journal of agricultural and food chemistry (2019), Vol. 67, No. 41, pp. 11364	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
80	CA 5.8.1	Kwiatkowska M. et al.	2020	Evaluation of apoptotic potential of glyphosate metabolites and impurities in human peripheral blood mononuclear cells (in vitro study).	Food and chemical toxicology (2020) Vol. 135, pp. 110888	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
47	CA 5.8.2	Forsythe S. D. et al.	2018	Environmental Toxin Screening Using Human-Derived 3D Bioengineered Liver and Cardiac Organoids.	Frontiers in public health (2018), Vol. 6, pp. 103	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
52	CA 5.8.3	Gigante P. et al.	2018	Glyphosate affects swine ovarian and adipose stromal cell functions.	Animal reproduction science (2018), Vol. 195, pp. 185	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
102	CA 5.8.3	Mesnage R. et al.	2017	Evaluation of estrogen receptor alpha activation by glyphosate-based herbicide constituents.	Food and chemical toxicology (2017) Vol. 108, No. Pt A, pp. 30	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
162	CA 5.8.3	Thongprakaisang S. et al.	2013	Glyphosate induces human breast cancer cells growth via estrogen receptors.	Food and chemical toxicology (2013), Vol. 59, pp. 129	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
23	CA 5.9	Connolly A. et al.	2018	Characterising glyphosate exposures among amenity horticulturists using multiple spot urine samples.	International journal of hygiene and environmental health (2018), Vol. 221, No. 7, pp. 1012	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
24	CA 5.9	Connolly A. et al.	2019	Exploring the half-life of glyphosate in human urine samples.	International journal of hygiene and environmental health (2019), Vol. 222, No. 2, pp. 205	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
25	CA 5.9	Connolly A. et al.	2017	Exposure assessment using human biomonitoring for glyphosate and fluroxypyr users in amenity horticulture.	International journal of hygiene and environmental health (2017), Vol. 220, No. 6, pp. 1064	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
26	CA 5.9	Connolly A. et al.	2018	Glyphosate in Irish adults - A pilot study in 2017.	Environmental research (2018), Vol. 165, pp. 235	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
27	CA 5.9	Connolly A. et al.	2019	Evaluating Glyphosate Exposure Routes and Their Contribution to Total Body Burden: A Study Among Amenity Horticulturalists.	Annals of work exposures and health (2019), Vol. 63, No. 2, pp. 133	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
28	CA 5.9	Conrad A. et al.	2017	Glyphosate in German adults - Time trend (2001 to 2015) of human exposure to a widely used herbicide	International journal of hygiene and environmental health (2017), Vol. 220, No. 1, pp. 8	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
77	CA 5.9	Kongtip P. et al.	2017	Glyphosate and Paraquat in Maternal and Fetal Serums in Thai Women.	Journal of agromedicine (2017), Vol. 22, No. 3, pp. 282	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
98	CA 5.9	McGuire M. K. et al.	2016	Glyphosate and aminomethylphosphonic acid are not detectable in human milk.	The American journal of clinical nutrition (2016), Vol. 103, No. 5, pp. 1285	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
146	CA 5.9	Sierra-Diaz E. et al.	2019	Urinary pesticide levels in children and adolescents residing in two agricultural communities in Mexico	International Journal of Environmental Research and Public Health (2019), Vol. 16, No. 4, pp. 562	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
150	CA 5.9	Steinborn A. et al.	2016	Determination of Glyphosate Levels in Breast Milk Samples from Germany by LC-MS/MS and GC-MS/MS.	Journal of agricultural and food chemistry (2016), Vol. 64, No. 6, pp. 1414	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
166	CA 5.9	Trasande L. et al.	2020	Glyphosate exposures and kidney injury biomarkers in infants and young children.	Environmental pollution (2020), Vol. 256, pp. 113334	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
11	CA 6.10.1	Berg C. J. et al.	2018	Glyphosate residue concentrations in honey attributed through geospatial analysis to proximity of large-scale agriculture and transfer off-site by bees.	PloS one (2018), Vol. 13, No. 7, pp. 0198876	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
21	CA 6.10.1	Chiesa L. M. et al.	2019	Detection of glyphosate and its metabolites in food of animal origin based on ion-chromatography-high resolution mass spectrometry (IC-HRMS).	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2019), Vol. 36, No. 4, pp. 592	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
45	CA 6.10.1	El Agrebi N. et al.	2020	Honeybee and consumer's exposure and risk characterisation to glyphosate-based herbicide (GBH) and its degradation product (AMPA): Residues in beebread, wax, and honey.	The Science of the total environment, (2020), Vol. 704, pp. 135312	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
72	CA 6.10.1	Karise R. et al.	2017	Are pesticide residues in honey related to oilseed rape treatments?.	Chemosphere (2017), Vol. 188, pp. 389	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
132	CA 6.10.1	Rubio F. et al.	2014	Survey of Glyphosate Residues in Honey, Corn and Soy Products	Journal of Environmental and Analytical Toxicology (2014), Vol. 5, pp. 249	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
161	CA 6.10.1	Thompson T. S et al.	2019	Determination of glyphosate, AMPA, and glufosinate in honey by online solid-phase extraction-liquid chromatography-tandem mass spectrometry.	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2019), Vol. 36, No. 3, pp. 434	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
142	CA 6.4.1	Shehata A. A. et al.	2014	Distribution of Glyphosate in Chicken Organs and its Reduction by Humic Acid Supplementation.	Journal of Poultry Science (2014), Vol. 51, No. 3, pp. 333	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
139	CA 6.4.2	Schnabel K. et al.	2017	Effects of glyphosate residues and different concentrate feed proportions on performance, energy metabolism and health characteristics in lactating dairy cows.	Archives of animal nutrition (2017) Vol. 71, No. 6, pp. 413	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
143	CA 6.4.2	Shelver W. L. et al.	2018	Distribution of Chemical Residues among Fat, Skim, Curd, Whey, and Protein Fractions in Fortified, Pasteurized Milk	ACS Omega (2018), Vol. 3, No. 8, pp. 8697	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
172	CA 6.4.2	von Soosten D. et al.	2016	Excretion pathways and ruminal disappearance of glyphosate and its degradation product aminomethylphosphonic acid in dairy cows.	Journal of dairy science (2016), Vol. 99, No. 7, pp. 5318	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
179	CA 6.9	Zoller O. et al.	2018	Glyphosate residues in Swiss market foods: monitoring and risk evaluation.	Food additives & contaminants. Part B, Surveillance (2018), Vol. 11, No. 2, pp. 83.	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
153	CA 7.1.1.1	Sun M. et al.	2019	Degradation of glyphosate and bioavailability of phosphorus derived from glyphosate in a soil-water system	Water research (2019), Vol. 163, pp. 114840	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
3	CA 7.1.2.1.1	Alexa E. et al.	2010	Studies on the biodegradation capacity of C-14-labelled glyphosate in vine plantation soils.	Journal of Food Agriculture & Environment (2010), Vol. 8, No. 3-4, Part 2, pp. 1193	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
4	CA 7.1.2.1.1	Al-Rajab A. J. et al.	2010	Degradation of 14C-glyphosate and aminomethylphosphonic acid (AMPA) in three agricultural soils.	Journal of environmental sciences (China) (2010), Vol. 22, No. 9, pp. 1374	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
113	CA 7.1.2.1.1	Nghia Nguyen Khoi et al.	2013	Soil properties governing biodegradation of the herbicide glyphosate in agricultural soils.	Proceedings of the 24th Asian-Pacific Weed Science Society Conference (2013), pp. 312	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
114	CA 7.1.2.1.1	Norgaard T. et al.	2015	Can Simple Soil Parameters Explain Field-Scale Variations in Glyphosate-, Bromoxyniloctanoate-, Diflufenican-, and Bentazone Mineralization?	Water, air, and soil pollution (2015), Vol. 226, No. 8, pp. 262	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
70	CA 7.1.2.1.1, CA 7.1.2.1.3, CA 7.1.3.1.1	Kanissery R. G. et al.	2015	Effect of soil aeration and phosphate addition on the microbial bioavailability of carbon-14-glyphosate.	Journal of environmental quality (2015), Vol. 44, No. 1, pp. 137	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
51	CA 7.1.2.1.1, CA 7.1.3.1	Ghafoor A. et al.	2011	Measurements and modeling of pesticide persistence in soil at the catchment scale.	The Science of the total environment, (2011), Vol. 409, No. 10, pp. 1900	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
20	CA 7.1.2.1.1, CA 7.1.3.1.1	Cassigneul A. et al.	2016	Fate of glyphosate and degradates in cover crop residues and underlying soil: A laboratory study.	The Science of the total environment (2016), Vol. 545-546, pp. 582	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
124	CA 7.1.2.1.1, CA 7.1.3.1.1	Rampoldi E. A. et al.	2014	Carbon-14-glyphosate behavior in relationship to pedoclimatic conditions and crop sequence.	Journal of environmental quality, (2014), Vol. 43, No. 2, pp. 558	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
178	CA 7.1.2.1.1, CA 7.1.3.1.1	Zhelezova A. et al.	2017	Effect of Biochar Amendment and Ageing on Adsorption and Degradation of Two Herbicides.	Water, air, and soil pollution (2017) Vol. 228, No. 6, pp. 216	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
12	CA 7.1.2.1.1, CA 7.1.3.1.1, CA 7.1.4.2	Bergstrom L. et al.	2011	Laboratory and Lysimeter Studies of Glyphosate and Aminomethylphosphonic Acid in a Sand and a Clay Soil	Journal of environmental quality (2011), Vol. 40, No. 1, pp. 98	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
5	CA 7.1.2.1.1, CA 7.1.4.1.1	Al-Rajab A. J. et al.	2014	Behavior of the non-selective herbicide glyphosate in agricultural soil.	American Journal of Environmental Sciences (2014), Vol. 10, No. 2, pp. 94	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
118	CA 7.1.2.2.1	Passeport E. et al.	2014	Dynamics and mitigation of six pesticides in a "Wet" forest buffer zone.	Environmental science and pollution research international (2014), Vol. 21, No. 7, pp. 4883	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
164	CA 7.1.2.2.1	Todorovic G. et al.	2014	Influence of soil tillage and erosion on the dispersion of glyphosate and aminomethylphosphonic acid in agricultural soils	International agrophysics (2014), Vol. 28, No. 1, pp. 93	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
2	CA 7.1.3.1.1	Albers C. et al.	2019	Soil Domain and Liquid Manure Affect Pesticide Sorption in Macroporous Clay Till.	Journal of environmental quality (2019), Vol. 48, No. 1, pp. 147	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
42	CA 7.1.3.1.1	Dollinger J. et al.	2018	Contrasting soil property patterns between ditch bed and neighbouring field profiles evidence the need of specific approaches when assessing water and pesticide fate in farmed landscapes	Geoderma (2018), Vol. 309, pp. 50	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
43	CA 7.1.3.1.1	Dollinger J. et al.	2015	Glyphosate sorption to soils and sediments predicted by pedotransfer functions	Environmental chemistry letters (2015), Vol. 13, No. 3, pp. 293	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
55	CA 7.1.3.1.1	Gomez Ortiz A. M. et al.	2017	Sorption and desorption of glyphosate in Mollisols and Ultisols soils of Argentina.	Environmental toxicology and chemistry (2017), Vol. 36, No. 10, pp. 2587	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
67	CA 7.1.3.1.1	Jodeh S. et al.	2014	Fate and mobility of glyphosate leachate in palestinian soil using soil column	Journal of Materials and Environmental Science (2014) Vol. 5, No. 6, pp. 2008	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
107	CA 7.1.3.1.1	Munira S. et al.	2016	Phosphate fertilizer impacts on glyphosate sorption by soil.	Chemosphere (2016), Vol. 153, pp. 471	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
108	CA 7.1.3.1.1	Munira S. et al.	2017	Sorption and desorption of glyphosate, MCPA and tetracycline and their mixtures in soil as influenced by phosphate.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2017), Vol. 52, No. 12, pp. 887	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
109	CA 7.1.3.1.1	Munira S. et al.	2017	Phosphate and glyphosate sorption in soils following long-term phosphate applications	Geoderma (2017), Vol. 313, pp 146	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
145	CA 7.1.3.1.1, CA 7.1.3.1.2	Sidoli P. et al.	2016	Glyphosate and AMPA adsorption in soils: laboratory experiments and pedotransfer rules.	Environmental science and pollution research international (2016), Vol. 23, No. 6, pp. 5733	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
148	CA 7.1.3.1.1, CA 7.1.3.1.2	Skeff W. et al.	2018	Adsorption behaviors of glyphosate, glufosinate, aminomethylphosphonic acid, and 2-aminoethylphosphonic acid on three typical Baltic Sea sediments.	Marine Chemistry (2018) ,Vol. 198, pp. 1	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
159	CA 7.1.3.1.1, CA 7.1.3.1.2	Tevez H. R.	2015	pH dependence of Glyphosate adsorption on soil horizons.	Boletinf de la sociedad geologica Mexicana (2015), Vol. 67, No. 3, pp. 509	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
53	CA 7.1.4.1.1	Gjettermann B. et al.	2011	Kinetics of Glyphosate Desorption from Mobilized Soil Particles.	Soil Science Society of America journal (2011), Vol. 75, No. 2, pp. 434	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
54	CA 7.1.4.1.1	Gjettermann B. et al.	2011	Evaluation of Sampling Strategies for Pesticides in a Macroporous Sandy Loam Soil.	Soil & sediment contamination (2011), Vol. 20, No. 5	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
111	CA 7.1.4.2	Napoli M. et al.	2015	Leaching of Glyphosate and Aminomethylphosphonic Acid through Silty Clay Soil Columns under Outdoor Conditions.	Journal of environmental quality, (2015), Vol. 44, No. 5, pp. 1667	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
8	CA 7.1.4.3	Aronsson H. et al.	2011	Leaching of N, P and glyphosate from two soils after herbicide treatment and incorporation of a ryegrass catch crop.	Soil use and management (2011), Vol. 27, No. 1, pp. 54	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
19	CA 7.1.4.3	Candela L. et al.	2010	Glyphosate transport through weathered granite soils under irrigated and non-irrigated conditions--Barcelona, Spain.	The Science of the total environment, (2010), Vol. 408, No. 12, pp. 2509	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
75	CA 7.1.4.3	Kjaer J. et al.	2011	Transport modes and pathways of the strongly sorbing pesticides glyphosate and pendimethalin through structured drained soils.	Chemosphere (2011), Vol. 84, No. 4, pp. 471	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
167	CA 7.1.4.3	Ulen B. M. et al.	2014	Spatial variation in herbicide leaching from a marine clay soil via subsurface drains.	Pest management science (2014), Vol. 70, No. 3, pp. 405	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
168	CA 7.1.4.3	Ulen B. M. et al.	2012	Particulate-facilitated leaching of glyphosate and phosphorus from a marine clay soil via tile drains.	Acta agriculturae Scandinavica (2012), Vol. 62, pp. 241	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
174	CA 7.2.2.3	Wang S. et al.	2016	(Bio)degradation of glyphosate in water-sediment microcosms - A stable isotope co-labeling approach.	Water research (2016), Vol. 99, pp. 91	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
10	CA 7.3.1	Bento C. P. M. et al.	2017	Glyphosate and AMPA distribution in wind-eroded sediment derived from loess soil.	Environmental pollution (2017), Vol. 220, No. Pt B, pp. 1079-1089	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
9	CA 7.5	Assalin M. R. et al.	2010	Studies on degradation of glyphosate by several oxidative chemical processes: ozonation, photolysis and heterogeneous photocatalysis.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2010), Vol. 45, No. 1, pp. 89	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
13	CA 7.5	Birch H et. al.	2011	Micropollutants in stormwater runoff and combined sewer overflow in the Copenhagen area, Denmark.	Water science and technology : a journal of the International Association on Water Pollution Research (2011), Vol. 64, No. 2, pp. 485	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
15	CA 7.5	Botta F. et al.	2012	Phyt'Eaux Cites: application and validation of a programme to reduce surface water contamination with urban pesticides.	Chemosphere (2012), Vol. 86, No. 2, pp. 166	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
16	CA 7.5	Boucherie C. et al.	2010	"Ozone" and "GAC filtration" synergy for removal of emerging micropollutants in a drinking water treatment plant?	Water Science and Technology: Water Supply (2010), Vol. 10, No. 5, pp. 860	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
17	CA 7.5	Bruchet A. et al.	2011	Natural attenuation of priority and emerging contaminants during river bank filtration and artificial recharge	European Journal of Water Quality (2011), Vol. 42, No. 2, pp. 123	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
18	CA 7.5	Busetto M. et al.	2010	Surveys of herbicide glyphosate and degradation product aminomethyl phosphonic acid in waterways of Monza-Brionza province	Bollettino - Unione Italiana degli Esperti Ambientali (2010), Vol. 61, No. 4, pp. 46	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
29	CA 7.5	Coupe R. et al.	2012	Fate and transport of glyphosate and aminomethylphosphonic acid in surface waters of agricultural basins.	Pest management science (2012), Vol. 68, No. 1, pp. 16	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
34	CA 7.5	Dairon R. et al.	2017	Long-term impact of reduced tillage on water and pesticide flow in a drained context	Environmental Science and Pollution Research (2017), Vol. 24, pp. 6866	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
35	CA 7.5	Daouk S. et al.	2013	The herbicide glyphosate and its metabolite AMPA in the Lavaux vineyard area, western Switzerland: proof of widespread export to surface waters. Part II: the role of infiltration and surface runoff.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2013), Vol. 48, No. 9, pp. 725	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
36	CA 7.5	Daouk S. et al.	2013	The herbicide glyphosate and its metabolite AMPA in the Lavaux vineyard area, Western Switzerland: proof of widespread export to surface waters. Part I: method validation in different water matrices.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2013), Vol. 48, No. 9, pp. 717	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
39	CA 7.5	Desmet N. et al.	2016	A hybrid monitoring and modelling approach to assess the contribution of sources of glyphosate and AMPA in large river catchments.	The Science of the total environment (2016), Vol. 573, pp. 1580	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
40	CA 7.5	Di Guardo A. et al.	2018	A new methodology to identify surface water bodies at risk by using pesticide monitoring data: The glyphosate case study in Lombardy Region (Italy)	Science of the total environment (2018), Vol. 1; No. 610-611, pp. 421	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
41	CA 7.5	Di Guardo A. et al.	2016	A moni-modeling approach to manage groundwater risk to pesticide leaching at regional scale	Science of the Total Environment, (2016) Vol. 545-546, pp. 200-209. CODEN: STENDL. ISSN: 0048-9697.	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
50	CA 7.5	Gasperi J. et al.	2014	Micropollutants in urban stormwater: occurrence, concentrations, and atmospheric contributions for a wide range of contaminants in three French catchments	Environmental Science and Pollution Research (2014), Vol. 21, No. 8, pp. 5267	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
57	CA 7.5	Gregoire C. et al.	2010	Use and fate of 17 pesticides applied on a vineyard catchment.	International Journal of Environmental Analytical Chemistry (2010), Vol. 90, No. 3/6, pp. 406	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
58	CA 7.5	Hamann E. et al.	2016	The fate of organic micropollutants during long-term/long-distance river bank filtration	Science of the Total Environment, (2016) Vol. 545-546, pp. 629	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
59	CA 7.5	Hanke I. et al.	2010	Relevance of urban glyphosate use for surface water quality.	Chemosphere (2010), Vol. 81, No. 3, pp. 422	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
61	CA 7.5	Hedegaard M. J. et al.	2014	Microbial pesticide removal in rapid sand filters for drinking water treatment--potential and kinetics.	Water research (2014), Vol. 48, pp. 71	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
62	CA 7.5	Houtman C. J. et al.	2013	A multicomponent snapshot of pharmaceuticals and pesticides in the river Meuse basin	Environmental Toxicology and Chemistry (2013), Vol. 32, No. 11, pp. 2449	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
63	CA 7.5	Huntscha S. et al.	2018	Seasonal Dynamics of Glyphosate and AMPA in Lake Greifensee: Rapid Microbial Degradation in the Epilimnion During Summer.	Environmental science & technology, (2018), Vol. 52, No. 8, pp. 4641	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
66	CA 7.5	Imfeld G.	2013	Transport and attenuation of dissolved glyphosate and AMPA in a stormwater wetland.	Chemosphere (2013), Vol. 90, No. 4, pp. 1333	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
68	CA 7.5	Joensson J. et al.	2013	Removal and degradation of glyphosate in water treatment: a review.	Journal of Water Supply Research and Technology (2013), Vol. 62, No. 7, pp. 395	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
71	CA 7.5	Karanasios E. et al.	2018	Monitoring of glyphosate and AMPA in soil samples from two olive cultivation areas in Greece: aspects related to spray operators activities	Environmental Monitoring and Assessment (2018), Vol. 190, No. 6, pp. 1	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
74	CA 7.5	Kegel Schoonenberg F. et al.	2010	Reverse osmosis followed by activated carbon filtration for efficient removal of organic micropollutants from river bank filtrate.	Water science and technology (2010) Vol. 61, No. 10, pp. 2603	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
81	CA 7.5	Lamprea K. et al.	2011	Pollutant concentrations and fluxes in both stormwater and wastewater at the outlet of two urban watersheds in Nantes (France)	Urban Water Journal (2011), Vol. 8, no. 4, pp. 219	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
82	CA 7.5	Larsbo M. et al.	2016	Surface Runoff of Pesticides from a Clay Loam Field in Sweden.	Journal of environmental quality, (2016), Vol. 45, No. 4, pp. 1367	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
83	CA 7.5	Lefrancq M. et al.	2017	High frequency monitoring of pesticides in runoff water to improve understanding of their transport and environmental impacts.	The Science of the total environment, (2017), Vol. 587-588, pp. 75	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
84	CA 7.5	Lerch R. N. et al.	2017	Vegetative buffer strips for reducing herbicide transport in runoff: effects of buffer width, vegetation, and season.	Journal of the American Water Resources Association (2017), Vol. 53, No. 3, pp. 667	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
86	CA 7.5	Litz N. T. et al.	2011	Comparative studies on the retardation and reduction of glyphosate during subsurface passage.	Water research, (2011), Vol. 45, No. 10, pp. 3047	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
87	CA 7.5	Maillard E. et al.	2014	Pesticide mass budget in a stormwater wetland.	Environmental science & technology (2014), Vol. 48, No. 15, pp. 8603	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
88	CA 7.5	Maillard E. et al.	2011	Removal of pesticide mixtures in a stormwater wetland collecting runoff from a vineyard catchment.	The Science of the total environment, (2011), Vol. 409, No. 11, pp. 2317	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
89	CA 7.5	Malaguerra F. et al.	2012	Pesticides in water supply wells in Zealand, Denmark: A statistical analysis.	Science of the Total Environment, (2012), Vol. 414, pp. 433	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
90	CA 7.5	Malaguerra F. et al.	2013	Assessment of the contamination of drinking water supply wells by pesticides from surface water resources using a finite element reactive transport model and global sensitivity analysis techniques	Journal of hydrology (2013), Vol. 476, pp. 321	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
92	CA 7.5	Manassero A. et al.	2010	Glyphosate degradation in water employing the H2O2/UVC process.	Water research (2010), Vol. 44, No. 13, pp. 3875	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
94	CA 7.5	Martin J. et al.	2013	Sugarcane, herbicides and water pollution in Reunion Island: achievements and perspectives after ten years of monitoring.	Journees Internationales sur la Lutte contre les Mauvaises Herbes, (2013), pp. 641	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
97	CA 7.5	Masiol M. et al.	2018	Herbicides in river water across the northeastern Italy: occurrence and spatial patterns of glyphosate, aminomethylphosphonic acid, and glufosinate ammonium.	Environmental science and pollution research international (2018), Vol. 25, No. 24, pp. 24368	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
99	CA 7.5	McManus S. et al.	2014	Pesticide occurrence in groundwater and the physical characteristics in association with these detections in Ireland	Environmental Monitoring and Assessment (2014), Vol. 186, No. 11, pp. 7819	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
103	CA 7.5	Meyer B. et al.	2011	Concentrations of dissolved herbicides and pharmaceuticals in a small river in Luxembourg	Environmental Monitoring and Assessment (2011), Vol. 180, No. 1-4, pp. 127	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
105	CA 7.5	Moertl M. et al.	2013	Determination of glyphosate residues in Hungarian water samples by immunoassay	Microchemical Journal (2013), Vol. 107, pp. 143	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
106	CA 7.5	Mottes C. et al.	2017	Relationships between past and present pesticide applications and pollution at a watershed outlet: The case of a horticultural catchment in Martinique, French West Indies.	Chemosphere (2017), Vol. 184, pp. 762	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
112	CA 7.5	Napoli M. et al.	2016	Transport of Glyphosate and Aminomethylphosphonic Acid under Two Soil Management Practices in an Italian Vineyard.	Journal of environmental quality, (2016), Vol. 45, No. 5, pp. 1713	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
115	CA 7.5	Norgaard T. et al.	2014	Leaching of Glyphosate and Aminomethylphosphonic Acid from an Agricultural Field over a Twelve-Year Period	Vadose Zone Journal (2014), Vol. 13, No. 10, pp. 18	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
120	CA 7.5	Petersen J. et al.	2012	Sampling of herbicides in streams during flood events.	Journal of environmental monitoring (2012), Vol. 14, No. 12, pp. 3284	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
122	CA 7.5	Poiger T. et al.	2017	Occurrence of the herbicide glyphosate and its metabolite AMPA in surface waters in Switzerland determined with on-line solid phase extraction LC-MS/MS.	Environmental science and pollution research international (2017), Vol. 24, No. 2, pp. 1588	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
125	CA 7.5	Ramwell C. T. et al.	2014	Contribution of household herbicide usage to glyphosate and its degradate aminomethylphosphonic acid in surface water drains.	Pest management science (2014) Vol. 70, No. 12, pp. 1823	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
127	CA 7.5	Ravier S. et al.	2019	Monitoring of Glyphosate, Glufosinate-ammonium, and (Aminomethyl) phosphonic acid in ambient air of Provence-Alpes-Cote-d'Azur Region, France.	Atmospheric Environment (2019), Vol. 204, pp. 102	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
129	CA 7.5	Reoyo-Prats B. et al.	2017	Multicontamination phenomena occur more often than expected in Mediterranean coastal watercourses: Study case of the Tet River (France)	Science of the Total Environment (2017), Vol. 579, pp. 10	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
130	CA 7.5	Rosenbom A. et al.	2015	Pesticide leaching through sandy and loamy fields - Long-term lessons learnt from the Danish Pesticide Leaching Assessment Programme	Environmental Pollution (2015), Vol. 201, pp. 75	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
133	CA 7.5	Ruel S. M. et al.	2011	On-site evaluation of the removal of 100 micro-pollutants through advanced wastewater treatment processes for reuse applications.	Water Science and Technology (2011), Vol. 63, No. 11, pp. 2486	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
134	CA 7.5	Ruel S. M. et al.	2012	Occurrence and fate of relevant substances in wastewater treatment plants regarding Water Framework Directive and future legislations	Water Science and Technology (2012), Vol. 65, No. 7, pp. 1179	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
135	CA 7.5	Sabatier P. et al.	2014	Long-term relationships among pesticide applications, mobility, and soil erosion in a vineyard watershed.	Proceedings of the National Academy of Sciences of the United States of America (2014), Vol. 111, No. 44, pp. 15647	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
136	CA 7.5	Sanchis J. et al.	2012	Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid-phase extraction followed by liquid chromatography coupled to tandem mass spectrometry.	Analytical and bioanalytical chemistry (2012), Vol. 402, No. 7, pp. 2335	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
137	CA 7.5	Sanchis J. et al.	2012	Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid-phase extraction followed by liquid chromatography coupled to tandem mass spectrometry [Erratum to document cited in CA156:223888]	Analytical and Bioanalytical Chemistry (2012), Vol. 404, No. 2, pp. 617	5.4.1 case a) relevant and provides data for the risk assessment: Erratum to summary that is provided in MCA 7 (Sanchis et al.)
140	CA 7.5	Schreiner V. C. et al.	2016	Pesticide mixtures in streams of several European countries and the USA	Science of the Total Environment (2016), Vol. 573, pp. 680	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
144	CA 7.5	Shen Y. et al.	2011	Ozonation of herbicide glyphosate	Huanjing Kexue Xuebao (2011), Vol. 31, pp. 1647	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
147	CA 7.5	Silva V. et al.	2018	Distribution of glyphosate and aminomethylphosphonic acid (AMPA) in agricultural topsoils of the European Union	Science of the total environment (2018), Vol. 15, pp. 1352	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
151	CA 7.5	Stenrod M.	2015	Long-term trends of pesticides in Norwegian agricultural streams and potential future challenges in northern climate	Acta Agriculturae Scandinavica, Section B - Soil & Plant Science (2015), Vol. 65, pp. 199	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
155	CA 7.5	Szekacs A.	2015	Monitoring Pesticide Residues in Surface and Ground Water in Hungary: Surveys in 1990-2015	Journal of chemistry (2015), Article ID 717948	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
156	CA 7.5	Szekacs A.	2014	Monitoring and biological evaluation of surface water and soil micropollutants in Hungary	Carpathian Journal of Earth and Environmental Sciences (2014), Vol. 9, No. 3, pp. 47	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
158	CA 7.5	Tang T. et al.	2015	Quantification and characterization of glyphosate use and loss in a residential area.	The Science of the total environment (2015), Vol. 517, pp. 207	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
170	CA 7.5	Vialle C. et al.	2013	Pesticides in roof runoff: study of a rural site and a suburban site.	Journal of environmental management (2013), Vol. 120, pp. 48	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
176	CA 7.5	Zgheib S. et al.	2012	Priority pollutants in urban stormwater: Part 1 - Case of separate storm sewers	Water Research (2012), Vol. 46, No. 20, pp. 6683	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
7	CA 8.2.1	Antunes A. M. et al.	2017	Gender-specific histopathological response in guppies Poecilia reticulata exposed to glyphosate or its metabolite aminomethylphosphonic acid.	Journal of applied toxicology (2017), Vol. 37, No. 9, pp. 1098	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
141	CA 8.2.1	Schweizer M. et al.	2019	How glyphosate and its associated acidity affect early development in zebrafish (Danio rerio).	PeerJ (2019), Vol. 7, pp. e7094	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
154	CA 8.2.1	Syedkolaei-Gholami S. J. et al.	2013	Toxicity evaluation of Malathion, Carbaryle and Glyphosate in common carp fingerlings (Cyprinus carpio, Linnaeus, 1758).	Journal of Veterinary Research (2013), Vol. 68, No. 3, pp. 257	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
48	CA 8.2.1, CP 10.2.1	Gabriel U. U. et al.	2010	Toxicity of roundup (a glyphosate product) to fingerlings of Clarias gariepinus.	Animal Research International (2010), Vol. 7, No. 2, pp. 1184	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
85	CA 8.2.2, CA 8.2.5	Levine S. L. et al.	2015	Aminomethylphosphonic acid has low chronic toxicity to Daphnia magna and Pimephales promelas.	Environmental toxicology and chemistry (2015), Vol. 34, No. 6, pp. 1382	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
38	CA 8.2.2.1	de Brito Rodrigues L. et al.	2019	Impact of the glyphosate-based commercial herbicide, its components and its metabolite AMPA on non-target aquatic organisms.	Mutation research (2019), Vol. 842, pp. 94	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
163	CA 8.2.7.	Tian Y. et al.	2015	Growth inhibition of two herbicides on Spirodela polyrrhiza	Nongyao Kexue Yu Guanli (2015), Vol. 36, pp 61	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
32	CA 8.2.8	Daam M. A. et al.	2019	Lethal toxicity of the herbicides acetochlor, ametryn, glyphosate and metribuzin to tropical frog larvae.	Ecotoxicology (2019), Vol. 28, pp. 707	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
160	CA 8.3.1.3, CP 10.3.1.5	Thompson H. M. et al.	2014	Evaluating exposure and potential effects on honeybee brood (Apis mellifera) development using glyphosate as an example.	Integrated environmental assessment and management (2014), Vol. 10, No. 3, pp. 463	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
171	CA 8.4.1, CA 8.4.2.1, CA 8.5	von Merey G. et al.	2016	Glyphosate and aminomethylphosphonic acid chronic risk assessment for soil biota	Environmental toxicology and chemistry (2016), Vol. 35, pp. 2742	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
126	CP 9.2.4	Rasmussen S. B. et al.	2015	Effects of single rainfall events on leaching of glyphosate and bentazone on two different soil types, using the DAISY model	Vadose Zone Journal (2015), Vol. 14, No. 11, pp. 15	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCP 9

Table 33: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by author(s)

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
1	Adler-Flindt S. et al.	CA 5.4	2019	Comparative cytotoxicity of plant protection products and their active ingredients.	Toxicology In Vitro, (2019) Vol. 54, pp. 354	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
2	Albers C. et al.	CA 7.1.3.1.1	2019	Soil Domain and Liquid Manure Affect Pesticide Sorption in Macroporous Clay Till.	Journal of environmental quality, (2019) Vol. 48, No. 1, pp. 147	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
3	Alexa E. et al.	CA 7.1.2.1.1	2010	Studies on the biodegradation capacity of C-14-labelled glyphosate in vine plantation soils.	Journal of Food Agriculture & Environment (2010), Vol. 8, No. 3-4, Part 2, pp. 1193	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
4	Al-Rajab A. J. et al.	CA 7.1.2.1.1	2010	Degradation of 14C-glyphosate and aminomethylphosphonic acid (AMPA) in three agricultural soils.	Journal of environmental sciences (China), (2010) Vol. 22, No. 9, pp. 1374	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
5	Al-Rajab A. J. et al.	CA 7.1.2.1.1, CA 7.1.4.1.1	2014	Behavior of the non-selective herbicide glyphosate in agricultural soil.	American Journal of Environmental Sciences (2014), Vol. 10, No. 2, pp. 94	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
6	Andreotti G. et al.	CA 5.5	2018	Glyphosate Use and Cancer Incidence in the Agricultural Health Study	Journal of the national cancer institute (2018) Vol. 110, No. 5, pp. 509	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
7	Antunes A. M. et al.	CA 8.2.1	2017	Gender-specific histopathological response in guppies Poecilia reticulata exposed to glyphosate or its metabolite aminomethylphosphonic acid.	Journal of applied toxicology (2017), Vol. 37, No. 9, pp. 1098	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
8	Aronsson H. et al.	CA 7.1.4.3	2011	Leaching of N, P and glyphosate from two soils after herbicide treatment and incorporation of a ryegrass catch crop.	Soil use and management (2011), Vol. 27, No. 1, pp. 54	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
9	Assalin M. R. et al.	CA 7.5	2010	Studies on degradation of glyphosate by several oxidative chemical processes: ozonation, photolysis and heterogeneous photocatalysis.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2010), Vol. 45, No. 1, pp. 89	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
10	Bento C. P. M. et al.	CA 7.3.1	2017	Glyphosate and AMPA distribution in wind-eroded sediment derived from loess soil.	Environmental pollution (2017), Vol. 220, No. Pt B, pp. 1079-1089	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
11	Berg C. J. et al.	CA 6.10.1	2018	Glyphosate residue concentrations in honey attributed through geospatial analysis to proximity of large-scale agriculture and transfer off-site by bees.	PloS one (2018), Vol. 13, No. 7, pp. 0198876	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
12	Bergstrom L. et al.	CA 7.1.2.1.1, CA 7.1.3.1.1, CA 7.1.4.2	2011	Laboratory and Lysimeter Studies of Glyphosate and Aminomethylphosphonic Acid in a Sand and a Clay Soil	Journal of environmental quality (2011), Vol. 40, No. 1, pp. 98	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
13	Birch H et. al.	CA 7.5	2011	Micropollutants in stormwater runoff and combined sewer overflow in the Copenhagen area, Denmark.	Water science and technology : a journal of the International Association on Water Pollution Research (2011), Vol. 64, No. 2, pp. 485	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
14	Biserni M. et al.	CA 5.5	2019	Quizalofop-p-Ethyl Induces Adipogenesis in 3T3-L1 Adipocytes.	Toxicological sciences (2019), Vol. 1, No. 170, pp. 452	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
15	Botta F. et al.	CA 7.5	2012	Phyt'Eaux Cites: application and validation of a programme to reduce surface water contamination with urban pesticides.	Chemosphere (2012), Vol. 86, No. 2, pp. 166	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
16	Boucherie C. et al.	CA 7.5	2010	"Ozone" and "GAC filtration" synergy for removal of emerging micropollutants in a drinking water treatment plant?	Water Science and Technology: Water Supply (2010), Vol. 10, No. 5, pp. 860	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
17	Bruchet A. et al.	CA 7.5	2011	Natural attenuation of priority and emerging contaminants during river bank filtration and artificial recharge	European Journal of Water Quality (2011), Vol. 42, No. 2, pp. 123	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
18	Busetto M. et al.	CA 7.5	2010	Surveys of herbicide glyphosate and degradation product aminomethyl phosphonic acid in waterways of Monza-Brionza province	Bollettino - Unione Italiana degli Esperti Ambientali (2010), Vol. 61, No. 4, pp. 46	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
19	Candela L. et al.	CA 7.1.4.3	2010	Glyphosate transport through weathered granite soils under irrigated and non-irrigated conditions--Barcelona, Spain.	The Science of the total environment, (2010), Vol. 408, No. 12, pp. 2509	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
20	Cassigneul A. et al.	CA 7.1.2.1.1, CA 7.1.3.1.1	2016	Fate of glyphosate and degradates in cover crop residues and underlying soil: A laboratory study.	The Science of the total environment (2016), Vol. 545-546, pp. 582	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
21	Chiesa L. M. et al.	CA 6.10.1	2019	Detection of glyphosate and its metabolites in food of animal origin based on ion-chromatography-high resolution mass spectrometry (IC-HRMS).	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2019) Vol. 36, No. 4, pp. 592	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
22	Chorfa A. et al.	CA 5.7	2013	Specific pesticide-dependent increases in α-synuclein levels in human neuroblastoma (SH-SY5Y) and melanoma (SK-MEL-2) cell lines.	Toxicological sciences (2013), Vol. 133, No. 2, pp. 289	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
23	Connolly A. et al.	CA 5.9	2018	Characterising glyphosate exposures among amenity horticulturists using multiple spot urine samples.	International journal of hygiene and environmental health (2018), Vol. 221, No. 7, pp. 1012	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
24	Connolly A. et al.	CA 5.9	2019	Exploring the half-life of glyphosate in human urine samples.	International journal of hygiene and environmental health (2019), Vol. 222, No. 2, pp. 205	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
25	Connolly A. et al.	CA 5.9	2017	Exposure assessment using human biomonitoring for glyphosate and fluroxypyr users in amenity horticulture.	International journal of hygiene and environmental health (2017), Vol. 220, No. 6, pp. 1064	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
26	Connolly A. et al.	CA 5.9	2018	Glyphosate in Irish adults - A pilot study in 2017.	Environmental research (2018), Vol. 165, pp. 235	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
27	Connolly A. et al.	CA 5.9	2019	Evaluating Glyphosate Exposure Routes and Their Contribution to Total Body Burden: A Study Among Amenity Horticulturalists.	Annals of work exposures and health (2019), Vol. 63, No. 2, pp. 133	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
28	Conrad A. et al.	CA 5.9	2017	Glyphosate in German adults - Time trend (2001 to 2015) of human exposure to a widely used herbicide	International journal of hygiene and environmental health (2017), Vol. 220, No. 1, pp. 8	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
29	Coupe R. et al.	CA 7.5	2012	Fate and transport of glyphosate and aminomethylphosphonic acid in surface waters of agricultural basins.	Pest management science (2012), Vol. 68, No. 1, pp. 16	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
30	Crump K.	CA 5.5	2020	The Potential Effects of Recall Bias and Selection Bias on the Epidemiological Evidence for the Carcinogenicity of Glyphosate.	Risk analysis (2020), Vol. 40, pp. 696	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
31	da Silva Natara D. G. et al.	CA 5.4	2019	Interference of goethite in the effects of glyphosate and Roundup® on ZFL cell line.	Toxicology in vitro (2020), Vol. 65, pp. 104755	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
32	Daam M. A. et al.	CA 8.2.8	2019	Lethal toxicity of the herbicides acetochlor, ametryn, glyphosate and metribuzin to tropical frog larvae.	Ecotoxicology (2019), Vol. 28, pp. 707	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
33	Dai P. et al.	CA 5.6	2016	Effect of glyphosate on reproductive organs in male rat.	Acta histochemica (2016) Vol. 118, No. 5, pp. 51	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
34	Dairon R. et al.	CA 7.5	2017	Long-term impact of reduced tillage on water and pesticide flow in a drained context	Environmental Science and Pollution Research (2017), Vol. 24, pp. 6866	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
35	Daouk S. et al.	CA 7.5	2013	The herbicide glyphosate and its metabolite AMPA in the Lavaux vineyard area, western Switzerland: proof of widespread export to surface waters. Part II: the role of infiltration and surface runoff.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2013), Vol. 48, No. 9, pp. 725	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
36	Daouk S. et al.	CA 7.5	2013	The herbicide glyphosate and its metabolite AMPA in the Lavaux vineyard area, Western Switzerland: proof of widespread export to surface waters. Part I: method validation in different water matrices.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2013), Vol. 48, No. 9, pp. 717	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
37	de Almeida, L. K. S. et al.	CA 5.4	2018	Moderate levels of glyphosate and its formulations vary in their cytotoxicity and genotoxicity in a whole blood model and in human cell lines with different estrogen receptor status.	3 Biotech (2018), Vol. 8, No. 10, pp. 438	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
38	de Brito Rodrigues L. et al.	CA 8.2.2.1	2019	Impact of the glyphosate-based commercial herbicide, its components and its metabolite AMPA on non-target aquatic organisms.	Mutation research (2019), Vol. 842, pp. 94	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
39	Desmet N. et al.	CA 7.5	2016	A hybrid monitoring and modelling approach to assess the contribution of sources of glyphosate and AMPA in large river catchments.	The Science of the total environment (2016), Vol. 573, pp. 1580	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
40	Di Guardo A. et al.	CA 7.5	2018	A new methodology to identify surface water bodies at risk by using pesticide monitoring data: The glyphosate case study in Lombardy Region (Italy)	Science of the total environment (2018), Vol. 1; No. 610-611, pp. 421	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
41	Di Guardo A. et al.	CA 7.5	2016	A moni-modeling approach to manage groundwater risk to pesticide leaching at regional scale	Science of the Total Environment, (2016) Vol. 545-546, pp. 200-209. CODEN: STENDL. ISSN: 0048-9697.	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
42	Dollinger J. et al.	CA 7.1.3.1.1	2018	Contrasting soil property patterns between ditch bed and neighbouring field profiles evidence the need of specific approaches when assessing water and pesticide fate in farmed landscapes	Geoderma (2018), Vol. 309, pp. 50	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
43	Dollinger J. et al.	CA 7.1.3.1.1	2015	Glyphosate sorption to soils and sediments predicted by pedotransfer functions	Environmental chemistry letters (2015), Vol. 13, No. 3, pp. 293	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
44	Duforestel M. et al.	CA 5.5	2019	Glyphosate Primes Mammary Cells for Tumorigenesis by Reprogramming the Epigenome in a TET3-Dependent Manner.	Frontiers in genetics (2019), Vol. 10, pp. 885	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
45	El Agrebi N. et al.	CA 6.10.1	2020	Honeybee and consumer's exposure and risk characterisation to glyphosate-based herbicide (GBH) and its degradation product (AMPA): Residues in beebread, wax, and honey.	The Science of the total environment, (2020), Vol. 704, pp. 135312	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
46	Forgacs A. L. et al.	CA 5.6	2012	BLTK1 murine Leydig cells: a novel steroidogenic model for evaluating the effects of reproductive and developmental toxicants.	Toxicological sciences (2012), Vol. 127, No. 2, pp. 391	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
47	Forsythe S. D. et al.	CA 5.8.2	2018	Environmental Toxin Screening Using Human-Derived 3D Bioengineered Liver and Cardiac Organoids.	Frontiers in public health (2018), Vol. 6, pp. 103	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
48	Gabriel U. U. et al.	CA 8.2.1, CP 10.2.1	2010	Toxicity of roundup (a glyphosate product) to fingerlings of Clarias gariepinus.	Animal Research International (2010), Vol. 7, No. 2, pp. 1184	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
49	Gao H. et al.	CA 5.3	2019	Activation of the N-methyl-d-aspartate receptor is involved in glyphosate-induced renal proximal tubule cell apoptosis.	Journal of applied toxicology (2019), Vol. 39, pp. 1096	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
50	Gasperi J. et al.	CA 7.5	2014	Micropollutants in urban stormwater: occurrence, concentrations, and atmospheric contributions for a wide range of contaminants in three French catchments	Environmental Science and Pollution Research (2014), Vol. 21, No. 8, pp. 5267	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
51	Ghafoor A. et al.	CA 7.1.2.1.1, CA 7.1.3.1	2011	Measurements and modeling of pesticide persistence in soil at the catchment scale.	The Science of the total environment, (2011), Vol. 409, No. 10, pp. 1900	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
52	Gigante P. et al.	CA 5.8.3	2018	Glyphosate affects swine ovarian and adipose stromal cell functions.	Animal reproduction science (2018), Vol. 195, pp. 185	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
53	Gjettermann B. et al.	CA 7.1.4.1.1	2011	Kinetics of Glyphosate Desorption from Mobilized Soil Particles.	Soil Science Society of America journal (2011), Vol. 75, No. 2, pp. 434	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
54	Gjettermann B. et al.	CA 7.1.4.1.1	2011	Evaluation of Sampling Strategies for Pesticides in a Macroporous Sandy Loam Soil.	Soil & sediment contamination (2011), Vol. 20, No. 5	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
55	Gomez Ortiz A. M. et al.	CA 7.1.3.1.1	2017	Sorption and desorption of glyphosate in Mollisols and Ultisols soils of Argentina.	Environmental toxicology and chemistry (2017), Vol. 36, No. 10, pp. 2587	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
56	Gorga A. et al.	CA 5.6	2020	In vitro effects of glyphosate and Roundup on Sertoli cell physiology.	Toxicology in vitro (2020), Vol. 62, pp. 104682	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
57	Gregoire C. et al.	CA 7.5	2010	Use and fate of 17 pesticides applied on a vineyard catchment.	International Journal of Environmental Analytical Chemistry (2010), Vol. 90, No. 3/6, pp. 406	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
58	Hamann E. et al.	CA 7.5	2016	The fate of organic micropollutants during long-term/long-distance river bank filtration	Science of the Total Environment (2016), Vol. 545-546, pp. 629	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
59	Hanke I. et al.	CA 7.5	2010	Relevance of urban glyphosate use for surface water quality.	Chemosphere (2010), Vol. 81, No. 3, pp. 422	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
60	Hao Y. et al.	CA 5.8.1	2019	Roundup-Induced AMPK/mTOR-Mediated Autophagy in Human A549 Cells.	Journal of agricultural and food chemistry (2019), Vol. 67, No. 41, pp. 11364	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
61	Hedegaard M. J. et al.	CA 7.5	2014	Microbial pesticide removal in rapid sand filters for drinking water treatment--potential and kinetics.	Water research (2014), Vol. 48, pp. 71	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
62	Houtman C. J. et al.	CA 7.5	2013	A multicomponent snapshot of pharmaceuticals and pesticides in the river Meuse basin	Environmental Toxicology and Chemistry (2013), Vol. 32, No. 11, pp. 2449	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
63	Huntscha S. et al.	CA 7.5	2018	Seasonal Dynamics of Glyphosate and AMPA in Lake Greifensee: Rapid Microbial Degradation in the Epilimnion During Summer.	Environmental science & technology, (2018), Vol. 52, No. 8, pp. 4641	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
64	Ilyushina N. A. et al.	CA 5.4	2018	Comparative investigation of genotoxic activity of glyphosate technical products in the micronucleus test in vivo.	Toksikologicheskii Vestnik (2018), No. 4, pp. 24	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
65	Ilyushina N. A. et al.	CA 5.4	2019	Maximum tolerated doses and erythropoiesis effects in the mouse bone marrow by 79 pesticides' technical materials assessed with the micronucleus assay.	Toxicology Reports (2019), Vol. 6, pp. 105	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
66	Imfeld G.	CA 7.5	2013	Transport and attenuation of dissolved glyphosate and AMPA in a stormwater wetland.	Chemosphere (2013), Vol. 90, No. 4, pp. 1333	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
67	Jodeh S. et al.	CA 7.1.3.1.1	2014	Fate and mobility of glyphosate leachate in palestinian soil using soil column	Journal of Materials and Environmental Science (2014) Vol. 5, No. 6, pp. 2008	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
68	Joensson J. et al.	CA 7.5	2013	Removal and degradation of glyphosate in water treatment: a review.	Journal of Water Supply Research and Technology (2013), Vol. 62, No. 7, pp. 395	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
69	Johansson H. et al.	CA 5.6	2018	Exposure to a glyphosate-based herbicide formulation, but not glyphosate alone, has only minor effects on adult rat testis.	Reproductive toxicology (2018), Vol. 82, pp. 25	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
70	Kanissery R. G. et al.	CA 7.1.2.1.1, CA 7.1.2.1.3, CA 7.1.3.1.1	2015	Effect of soil aeration and phosphate addition on the microbial bioavailability of carbon-14-glyphosate.	Journal of environmental quality (2015), Vol. 44, No. 1, pp. 137	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
71	Karanasios E. et al.	CA 7.5	2018	Monitoring of glyphosate and AMPA in soil samples from two olive cultivation areas in Greece: aspects related to spray operators activities	Environmental Monitoring and Assessment (2018), Vol. 190, No. 6, pp. 1	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
72	Karise R. et al.	CA 6.10.1	2017	Are pesticide residues in honey related to oilseed rape treatments?.	Chemosphere (2017), Vol. 188, pp. 389	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
73	Kasuba V. et al.	CA 5.4	2017	Effects of low doses of glyphosate on DNA damage, cell proliferation and oxidative stress in the HepG2 cell line.	Environmental science and pollution research international (2017), Vol. 24, No. 23, pp. 19267	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
74	Kegel Schoonenberg F. et al.	CA 7.5	2010	Reverse osmosis followed by activated carbon filtration for efficient removal of organic micropollutants from river bank filtrate.	Water science and technology (2010) Vol. 61, No. 10, pp. 2603	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
75	Kjaer J. et al.	CA 7.1.4.3	2011	Transport modes and pathways of the strongly sorbing pesticides glyphosate and pendimethalin through structured drained soils.	Chemosphere (2011), Vol. 84, No. 4, pp. 471	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
76	Koller V. J. et al.	CA 5.4	2012	Cytotoxic and DNA-damaging properties of glyphosate and Roundup in human-derived buccal epithelial cells.	Archives of toxicology (2012), Vol. 86, No. 5, pp. 805	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
77	Kongtip P. et al.	CA 5.9	2017	Glyphosate and Paraquat in Maternal and Fetal Serums in Thai Women.	Journal of agromedicine (2017), Vol. 22, No. 3, pp. 282	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
78	Kumar S. et al.	CA 5.3	2014	Glyphosate-rich air samples induce IL-33, TSLP and generate IL-13 dependent airway inflammation.	Toxicology (2014), Vol. 325, pp. 42	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
79	Kwiatkowska M. et al.	CA 5.4	2017	DNA damage and methylation induced by glyphosate in peripheral blood mononuclear cells (in vitro study)	Food and chemical toxicology (2017), Vol. 105, pp. 93	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
80	Kwiatkowska M. et al.	CA 5.8.1	2020	Evaluation of apoptotic potential of glyphosate metabolites and impurities in human peripheral blood mononuclear cells (in vitro study).	Food and chemical toxicology (2020) Vol. 135, pp. 110888	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
81	Lamprea K. et al.	CA 7.5	2011	Pollutant concentrations and fluxes in both stormwater and wastewater at the outlet of two urban watersheds in Nantes (France)	Urban Water Journal (2011), Vol. 8, no. 4, pp. 219	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
82	Larsbo M. et al.	CA 7.5	2016	Surface Runoff of Pesticides from a Clay Loam Field in Sweden.	Journal of environmental quality, (2016), Vol. 45, No. 4, pp. 1367	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
83	Lefrancq M. et al.	CA 7.5	2017	High frequency monitoring of pesticides in runoff water to improve understanding of their transport and environmental impacts.	The Science of the total environment, (2017), Vol. 587-588, pp. 75	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
84	Lerch R. N. et al.	CA 7.5	2017	Vegetative buffer strips for reducing herbicide transport in runoff: effects of buffer width, vegetation, and season.	Journal of the American Water Resources Association (2017), Vol. 53, No. 3, pp. 667	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
85	Levine S. L. et al.	CA 8.2.2, CA 8.2.5	2015	Aminomethylphosphonic acid has low chronic toxicity to Daphnia magna and Pimephales promelas.	Environmental toxicology and chemistry (2015), Vol. 34, No. 6, pp. 1382	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
86	Litz N. T. et al.	CA 7.5	2011	Comparative studies on the retardation and reduction of glyphosate during subsurface passage.	Water research, (2011), Vol. 45, No. 10, pp. 3047	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
87	Maillard E. et al.	CA 7.5	2014	Pesticide mass budget in a stormwater wetland.	Environmental science & technology (2014), Vol. 48, No. 15, pp. 8603	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
88	Maillard E. et al.	CA 7.5	2011	Removal of pesticide mixtures in a stormwater wetland collecting runoff from a vineyard catchment.	The Science of the total environment, (2011), Vol. 409, No. 11, pp. 2317	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
89	Malaguerra F. et al.	CA 7.5	2012	Pesticides in water supply wells in Zealand, Denmark: A statistical analysis.	Science of the Total Environment, (2012), Vol. 414, pp. 433	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
90	Malaguerra F. et al.	CA 7.5	2013	Assessment of the contamination of drinking water supply wells by pesticides from surface water resources using a finite element reactive transport model and global sensitivity analysis techniques	Journal of hydrology (2013), Vol. 476, pp. 321	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
91	Manas F. et al.	CA 5.4	2013	Oxidative stress and comet assay in tissues of mice administered glyphosate and ampa in drinking water for 14 days.	Journal of Basic and Applied Genetics (2013), Vol. 24, No. 2, pp. 67	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
92	Manassero A. et al.	CA 7.5	2010	Glyphosate degradation in water employing the H2O2/UVC process.	Water research (2010), Vol. 44, No. 13, pp. 3875	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
93	Manservisi F. et al.	CA 5.6	2019	The Ramazzini Institute 13-week pilot study glyphosate-based herbicides administered at human-equivalent dose to Sprague Dawley rats: effects on development and endocrine system.	Environmental health (2019), Vol. 18, No. 1, pp. 15	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
94	Martin J. et al.	CA 7.5	2013	Sugarcane, herbicides and water pollution in Reunion Island: achievements and perspectives after ten years of monitoring.	Journees Internationales sur la Lutte contre les Mauvaises Herbes, (2013), pp. 641	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
95	Martinez A. et al.	CA 5.7	2019	Effects of glyphosate and aminomethylphosphonic acid on an isogeneic model of the human blood-brain barrier.	Toxicology letters (2019), Vol. 304, pp. 39	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
96	Martinez M. A. et al.	CA 5.7	2018	Neurotransmitter changes in rat brain regions following glyphosate exposure.	Environmental research (2018), Vol. 161, pp. 212	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
97	Masiol M. et al.	CA 7.5	2018	Herbicides in river water across the northeastern Italy: occurrence and spatial patterns of glyphosate, aminomethylphosphonic acid, and glufosinate ammonium.	Environmental science and pollution research international (2018), Vol. 25, No. 24, pp. 24368	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
98	McGuire M. K. et al.	CA 5.9	2016	Glyphosate and aminomethylphosphonic acid are not detectable in human milk.	The American journal of clinical nutrition (2016), Vol. 103, No. 5, pp. 1285	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
99	McManus S. et al.	CA 7.5	2014	Pesticide occurrence in groundwater and the physical characteristics in association with these detections in Ireland	Environmental Monitoring and Assessment (2014), Vol. 186, No. 11, pp. 7819	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
100	Mesnage R. et al.	CA 5.3	2018	Comparison of transcriptome responses to glyphosate, isoxaflutole, quizalofop-p-ethyl and mesotrione in the HepaRG cell line.	Toxicology reports (2018), Vol. 5, pp. 819	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
101	Mesnage R. et al.	CA 5.8	2018	Ignoring Adjuvant Toxicity Falsifies the Safety Profile of Commercial Pesticides.	Frontiers in Public Health (2018), Vol. 5, pp. 361	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
102	Mesnage R. et al.	CA 5.8.3	2017	Evaluation of estrogen receptor alpha activation by glyphosate-based herbicide constituents.	Food and chemical toxicology (2017) Vol. 108, No. Pt A, pp. 30	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
103	Meyer B. et al.	CA 7.5	2011	Concentrations of dissolved herbicides and pharmaceuticals in a small river in Luxembourg	Environmental Monitoring and Assessment (2011), Vol. 180, No. 1-4, pp. 127	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
104	Milic M. et al.	CA 5.3	2018	Oxidative stress, cholinesterase activity, and DNA damage in the liver, whole blood, and plasma of Wistar rats following a 28-day exposure to glyphosate.	Arhiv za higijenu rada i toksikologiju (2018), Vol. 69, No. 2, pp. 154	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
105	Moertl M. et al.	CA 7.5	2013	Determination of glyphosate residues in Hungarian water samples by immunoassay	Microchemical Journal (2013), Vol. 107, pp. 143	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
106	Mottes C. et al.	CA 7.5	2017	Relationships between past and present pesticide applications and pollution at a watershed outlet: The case of a horticultural catchment in Martinique, French West Indies.	Chemosphere (2017), Vol. 184, pp. 762	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
107	Munira S. et al.	CA 7.1.3.1.1	2016	Phosphate fertilizer impacts on glyphosate sorption by soil.	Chemosphere (2016), Vol. 153, pp. 471	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
108	Munira S. et al.	CA 7.1.3.1.1	2017	Sorption and desorption of glyphosate, MCPA and tetracycline and their mixtures in soil as influenced by phosphate.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2017), Vol. 52, No. 12, pp. 887	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
109	Munira S. et al.	CA 7.1.3.1.1	2017	Phosphate and glyphosate sorption in soils following long-term phosphate applications	Geoderma (2017), Vol. 313, pp 146	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
110	Nagy K. et al.	CA 5.4	2019	Comparative cyto- and genotoxicity assessment of glyphosate and glyphosate-based herbicides in human peripheral white blood cells.	Environmental research (2019), Vol. 179, No. Pt B, pp. 108851	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
111	Napoli M. et al.	CA 7.1.4.2	2015	Leaching of Glyphosate and Aminomethylphosphonic Acid through Silty Clay Soil Columns under Outdoor Conditions.	Journal of environmental quality, (2015), Vol. 44, No. 5, pp. 1667	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
112	Napoli M. et al.	CA 7.5	2016	Transport of Glyphosate and Aminomethylphosphonic Acid under Two Soil Management Practices in an Italian Vineyard.	Journal of environmental quality, (2016), Vol. 45, No. 5, pp. 1713	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
113	Nghia Nguyen Khoi et al.	CA 7.1.2.1.1	2013	Soil properties governing biodegradation of the herbicide glyphosate in agricultural soils.	Proceedings of the 24th Asian-Pacific Weed Science Society Conference (2013), pp. 312	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
114	Norgaard T. et al.	CA 7.1.2.1.1	2015	Can Simple Soil Parameters Explain Field-Scale Variations in Glyphosate-, Bromoxyniloctanoate-, Diflufenican-, and Bentazone Mineralization?	Water, air, and soil pollution (2015), Vol. 226, No. 8, pp. 262	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
115	Norgaard T. et al.	CA 7.5	2014	Leaching of Glyphosate and Aminomethylphosphonic Acid from an Agricultural Field over a Twelve-Year Period	Vadose Zone Journal (2014), Vol. 13, No. 10, pp. 18	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
116	Pahwa M. et al.	CA 5.5	2019	Glyphosate use and associations with non-Hodgkin lymphoma major histological sub-types: findings from the North American Pooled Project.	Scandinavian journal of work, environment & health (2019), Vol. 1; No. 45, pp. 600	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
117	Panzacchi S. et al.	CA 5.6	2018	The Ramazzini Institute 13-week study on glyphosate-based herbicides at humanequivalent dose in Sprague Dawley rats: study design and first in-life endpoints evaluation	Environmental Health (2018), Vol. 17, pp. 52/1	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
118	Passeport E. et al.	CA 7.1.2.2.1	2014	Dynamics and mitigation of six pesticides in a "Wet" forest buffer zone.	Environmental science and pollution research international (2014), Vol. 21, No. 7, pp. 4883	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
119	Perego M. C. et al.	CA 5.6	2017	Evidence for direct effects of glyphosate on ovarian function: glyphosate influences steroidogenesis and proliferation of bovine granulosa but not theca cells in vitro.	Journal of applied toxicology (2017), Vol. 37, No. 6, pp. 692	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
120	Petersen J. et al.	CA 7.5	2012	Sampling of herbicides in streams during flood events.	Journal of environmental monitoring (2012), Vol. 14, No. 12, pp. 3284	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
121	Pham Thu H. et al.	CA 5.6	2019	Perinatal Exposure to Glyphosate and a Glyphosate-Based Herbicide Affect Spermatogenesis in Mice.	Toxicological sciences (2019), Vol. 169, No. 1, pp. 260	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
122	Poiger T. et al.	CA 7.5	2017	Occurrence of the herbicide glyphosate and its metabolite AMPA in surface waters in Switzerland determined with on-line solid phase extraction LC-MS/MS.	Environmental science and pollution research international (2017), Vol. 24, No. 2, pp. 1588	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
123	Presutti R. et al.	CA 5.5	2016	Pesticide exposures and the risk of multiple myeloma in men: An analysis of the North American Pooled Project.	International Journal of Cancer (2016), Vol. 139, No. 8, pp. 1703	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
124	Rampoldi E. A. et al.	CA 7.1.2.1.1, CA 7.1.3.1.1	2014	Carbon-14-glyphosate behavior in relationship to pedoclimatic conditions and crop sequence.	Journal of environmental quality, (2014), Vol. 43, No. 2, pp. 558	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
125	Ramwell C. T. et al.	CA 7.5	2014	Contribution of household herbicide usage to glyphosate and its degradate aminomethylphosphonic acid in surface water drains.	Pest management science (2014) Vol. 70, No. 12, pp. 1823	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
126	Rasmussen S. B. et al.	CP 9.2.4	2015	Effects of single rainfall events on leaching of glyphosate and bentazone on two different soil types, using the DAISY model	Vadose Zone Journal (2015), Vol. 14, No. 11, pp. 15	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCP 9
127	Ravier S. et al.	CA 7.5	2019	Monitoring of Glyphosate, Glufosinate-ammonium, and (Aminomethyl) phosphonic acid in ambient air of Provence-Alpes-Cote-d'Azur Region, France.	Atmospheric Environment (2019), Vol. 204, pp. 102	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
128	Ren Xin et al.	CA 5.6	2019	Effects of chronic glyphosate exposure to pregnant mice on hepatic lipid metabolism in offspring.	Environmental pollution (2019), Vol. 254, No. Pt A, pp. 112906	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
129	Reoyo-Prats B. et al.	CA 7.5	2017	Multicontamination phenomena occur more often than expected in Mediterranean coastal watercourses: Study case of the Tet River (France)	Science of the Total Environment (2017), Vol. 579, pp. 10	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
130	Rosenbom A. et al.	CA 7.5	2015	Pesticide leaching through sandy and loamy fields - Long-term lessons learnt from the Danish Pesticide Leaching Assessment Programme	Environmental Pollution (2015), Vol. 201, pp. 75	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
131	Roustan A. et al.	CA 5.4	2014	Genotoxicity of mixtures of glyphosate and atrazine and their environmental transformation products before and after photoactivation.	Chemosphere (2014), Vol. 108, pp. 93	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
132	Rubio F. et al.	CA 6.10.1	2014	Survey of Glyphosate Residues in Honey, Corn and Soy Products	Journal of Environmental and Analytical Toxicology (2014), Vol. 5, pp. 249	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
133	Ruel S. M. et al.	CA 7.5	2011	On-site evaluation of the removal of 100 micro-pollutants through advanced wastewater treatment processes for reuse applications.	Water Science and Technology (2011), Vol. 63, No. 11, pp. 2486	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
134	Ruel S. M. et al.	CA 7.5	2012	Occurrence and fate of relevant substances in wastewater treatment plants regarding Water Framework Directive and future legislations	Water Science and Technology (2012), Vol. 65, No. 7, pp. 1179	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
135	Sabatier P. et al.	CA 7.5	2014	Long-term relationships among pesticide applications, mobility, and soil erosion in a vineyard watershed.	Proceedings of the National Academy of Sciences of the United States of America (2014), Vol. 111, No. 44, pp. 15647	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
136	Sanchis J. et al.	CA 7.5	2012	Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid-phase extraction followed by liquid chromatography coupled to tandem mass spectrometry.	Analytical and bioanalytical chemistry (2012), Vol. 402, No. 7, pp. 2335	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
137	Sanchis J. et al.	CA 7.5	2012	Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid-phase extraction followed by liquid chromatography coupled to tandem mass spectrometry [Erratum to document cited in CA156:223888]	Analytical and Bioanalytical Chemistry (2012), Vol. 404, No. 2, pp. 617	5.4.1 case a) relevant and provides data for the risk assessment: Erratum to summary that is provided in MCA 7 (Sanchis et al.)
138	Santovito A. et al.	CA 5.4	2018	In vitro evaluation of genomic damage induced by glyphosate on human lymphocytes.	Environmental science and pollution research international (2018), Vol. 25, No. 34, pp. 34693	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
139	Schnabel K. et al.	CA 6.4.2	2017	Effects of glyphosate residues and different concentrate feed proportions on performance, energy metabolism and health characteristics in lactating dairy cows.	Archives of animal nutrition (2017) Vol. 71, No. 6, pp. 413	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
140	Schreiner V. C. et al.	CA 7.5	2016	Pesticide mixtures in streams of several European countries and the USA	Science of the Total Environment (2016), Vol. 573, pp. 680	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
141	Schweizer M. et al.	CA 8.2.1	2019	How glyphosate and its associated acidity affect early development in zebrafish (Danio rerio).	PeerJ (2019), Vol. 7, pp. e7094	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
142	Shehata A. A. et al.	CA 6.4.1	2014	Distribution of Glyphosate in Chicken Organs and its Reduction by Humic Acid Supplementation.	Journal of Poultry Science (2014) Vol. 51, No. 3, pp. 333	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
143	Shelver W. L. et al.	CA 6.4.2	2018	Distribution of Chemical Residues among Fat, Skim, Curd, Whey, and Protein Fractions in Fortified, Pasteurized Milk	ACS Omega (2018,) Vol. 3, No. 8, pp. 8697	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
144	Shen Y. et al.	CA 7.5	2011	Ozonation of herbicide glyphosate	Huanjing Kexue Xuebao (2011), Vol. 31, pp. 1647	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
145	Sidoli P. et al.	CA 7.1.3.1.1, CA 7.1.3.1.2	2016	Glyphosate and AMPA adsorption in soils: laboratory experiments and pedotransfer rules.	Environmental science and pollution research international (2016), Vol. 23, No. 6, pp. 5733	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
146	Sierra-Diaz E. et al.	CA 5.9	2019	Urinary pesticide levels in children and adolescents residing in two agricultural communities in Mexico	International Journal of Environmental Research and Public Health (2019), Vol. 16, No. 4, pp. 562	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
147	Silva V. et al.	CA 7.5	2018	Distribution of glyphosate and aminomethylphosphonic acid (AMPA) in agricultural topsoils of the European Union	Science of the total environment (2018), Vol. 15, pp. 1352	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
148	Skeff W. et al.	CA 7.1.3.1.1, CA 7.1.3.1.2	2018	Adsorption behaviors of glyphosate, glufosinate, aminomethylphosphonic acid, and 2-aminoethylphosphonic acid on three typical Baltic Sea sediments.	Marine Chemistry (2018) ,Vol. 198, pp. 1	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
149	Sorahan T.	CA 5.5	2015	Multiple myeloma and glyphosate use: a re-analysis of US Agricultural Health Study (AHS) data.	International journal of environmental research and public health, (2015) Vol. 12, No. 2, pp. 1548	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
150	Steinborn A. et al.	CA 5.9	2016	Determination of Glyphosate Levels in Breast Milk Samples from Germany by LC-MS/MS and GC-MS/MS.	Journal of agricultural and food chemistry (2016), Vol. 64, No. 6, pp. 1414	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
151	Stenrod M.	CA 7.5	2015	Long-term trends of pesticides in Norwegian agricultural streams and potential future challenges in northern climate	Acta Agriculturae Scandinavica, Section B - Soil & Plant Science (2015), Vol. 65, pp. 199	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
152	Suarez-Larios K. et al.	CA 5.4	2017	Screening of Pesticides with the Potential of Inducing DSB and Successive Recombinational Repair.	Journal of Toxicology (2017), Article ID 3574840	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
153	Sun M. et al.	CA 7.1.1.1	2019	Degradation of glyphosate and bioavailability of phosphorus derived from glyphosate in a soil-water system	Water research (2019), Vol. 163, pp. 114840	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
154	Syedkolaei-Gholami S. J. et al.	CA 8.2.1	2013	Toxicity evaluation of Malathion, Carbaryle and Glyphosate in common carp fingerlings (Cyprinus carpio, Linnaeus, 1758).	Journal of Veterinary Research (2013), Vol. 68, No. 3, pp. 257	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
155	Szekacs A.	CA 7.5	2015	Monitoring Pesticide Residues in Surface and Ground Water in Hungary: Surveys in 1990-2015	Journal of chemistry (2015), Article ID 717948	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
156	Szekacs A.	CA 7.5	2014	Monitoring and biological evaluation of surface water and soil micropollutants in Hungary	Carpathian Journal of Earth and Environmental Sciences (2014), Vol. 9, No. 3, pp. 47	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
157	Tang J. et al.	CA 5.3	2017	Ion Imbalance Is Involved in the Mechanisms of Liver Oxidative Damage in Rats Exposed to Glyphosate.	Frontiers in physiology (2017), Vol. 8, pp. 1083	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
158	Tang T. et al.	CA 7.5	2015	Quantification and characterization of glyphosate use and loss in a residential area.	The Science of the total environment (2015), Vol. 517, pp. 207	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
159	Tevez H. R.	CA 7.1.3.1.1, CA 7.1.3.1.2	2015	pH dependence of Glyphosate adsorption on soil horizons.	Boletinf de la sociedad geologica Mexicana (2015), Vol. 67, No. 3, pp. 509	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
160	Thompson H. M. et al.	CA 8.3.1.3, CP 10.3.1.5	2014	Evaluating exposure and potential effects on honeybee brood (Apis mellifera) development using glyphosate as an example.	Integrated environmental assessment and management (2014), Vol. 10, No. 3, pp. 463	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
161	Thompson T. S et al.	CA 6.10.1	2019	Determination of glyphosate, AMPA, and glufosinate in honey by online solid-phase extraction-liquid chromatography-tandem mass spectrometry.	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2019) Vol. 36, No. 3, pp. 434	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
162	Thongprakaisang S. et al.	CA 5.8.3	2013	Glyphosate induces human breast cancer cells growth via estrogen receptors.	Food and chemical toxicology (2013), Vol. 59, pp. 129	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
163	Tian Y. et al.	CA 8.2.7.	2015	Growth inhibition of two herbicides on Spirodela polyrrhiza	Nongyao Kexue Yu Guanli (2015), Vol. 36, pp 61	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
164	Todorovic G. et al.	CA 7.1.2.2.1	2014	Influence of soil tillage and erosion on the dispersion of glyphosate and aminomethylphosphonic acid in agricultural soils	International agrophysics (2014), Vol. 28, No. 1, pp. 93	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
165	Townsend M. et al.	CA 5.4	2017	Evaluation of various glyphosate concentrations on DNA damage in human Raji cells and its impact on cytotoxicity.	Regulatory toxicology and pharmacology (2017), Vol. 85, pp. 79	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
166	Trasande L. et al.	CA 5.9	2020	Glyphosate exposures and kidney injury biomarkers in infants and young children.	Environmental pollution (2020), Vol. 256, pp. 113334	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
167	Ulen B. M. et al.	CA 7.1.4.3	2014	Spatial variation in herbicide leaching from a marine clay soil via subsurface drains.	Pest management science (2014), Vol. 70, No. 3, pp. 405	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
168	Ulen B. M. et al.	CA 7.1.4.3	2012	Particulate-facilitated leaching of glyphosate and phosphorus from a marine clay soil via tile drains.	Acta agriculturae Scandinavica (2012), Vol. 62, pp. 241	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
169	Vanlaeys A. et al.	CA 5.8	2018	Formulants of glyphosate-based herbicides have more deleterious impact than glyphosate on TM4 Sertoli cells.	Toxicology in vitro (2018), Vol. 52, pp. 14.	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
170	Vialle C. et al.	CA 7.5	2013	Pesticides in roof runoff: study of a rural site and a suburban site.	Journal of environmental management (2013), Vol. 120, pp. 48	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
171	von Merey G. et al.	CA 8.4.1, CA 8.4.2.1, CA 8.5	2016	Glyphosate and aminomethylphosphonic acid chronic risk assessment for soil biota	Environmental toxicology and chemistry (2016), Vol. 35, pp. 2742	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 8
172	von Soosten D. et al.	CA 6.4.2	2016	Excretion pathways and ruminal disappearance of glyphosate and its degradation product aminomethylphosphonic acid in dairy cows.	Journal of dairy science (2016), Vol. 99, No. 7, pp. 5318	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6
173	Wang L. et al.	CA 5.5	2019	Glyphosate induces benign monoclonal gammopathy and promotes multiple myeloma progression in mice.	Journal of hematology & oncology, (2019), Vol. 12, No. 1, pp. 70	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
174	Wang S. et al.	CA 7.2.2.3	2016	(Bio)degradation of glyphosate in water-sediment microcosms - A stable isotope co-labeling approach.	Water research (2016), Vol. 99, pp. 91	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
175	Wozniak E. et al.	CA 5.5	2019	Glyphosate affects methylation in the promoter regions of selected tumor suppressors as well as expression of major cell cycle and apoptosis drivers in PBMCs (in vitro study).	Toxicology in vitro (2019), Vol. 63, pp. 104736	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
176	Zgheib S. et al.	CA 7.5	2012	Priority pollutants in urban stormwater: Part 1 - Case of separate storm sewers	Water Research (2012), Vol. 46, No. 20, pp. 6683	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
177	Zhang J. et al.	CA 5.6	2019	The toxic effects and possible mechanisms of glyphosate on mouse oocytes.	Chemosphere (2019), Vol. 237, pp. 124435	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 5
178	Zhelezova A. et al.	CA 7.1.2.1.1, CA 7.1.3.1.1	2017	Effect of Biochar Amendment and Ageing on Adsorption and Degradation of Two Herbicides.	Water, air, and soil pollution (2017) Vol. 228, No. 6, pp. 216	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 7
179	Zoller O. et al.	CA 6.9	2018	Glyphosate residues in Swiss market foods: monitoring and risk evaluation.	Food additives & contaminants. Part B, Surveillance (2018), Vol. 11, No. 2, pp. 83.	5.4.1 case a) relevant and provides data for the risk assessment: Summary is provided in MCA 6

Table 34: Relevant but supplementary (category B) articles after detailed assessment: sorted by data requirement(s)

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
357	CA 5.1	Hopa E. et al.	2011	The inhibitory effects of some pesticides on human erythrocyte glucose-6-phosphate dehydrogenase activity (in vitro).	Fresenius Environmental Bulletin (2011), Vol. 20, No. 5a, pp. 1314	5.4.1 case b) Relevant but supplementary information: glyphosate and 2,4-D had been used as test material from a "local pesticide shop". No further identification of the test material had been provided, moreover the study design is not well described.
421	CA 5.2.1	Lee GaWon et al.	2018	Glyphosate surfactant herbicide toxicosis in a dog with hindlimb paresis and urinary incontinence	Journal of Veterinary Clinics (2018), Vol. 35, No. 4, pp. 144	5.4.1 case b) Relevant but supplementary information: Acute Pet Exposure which should not impact the re-registration.
368	CA 5.3	Jasper R. et al.	2012	Evaluation of biochemical, hematological and oxidative parameters in mice exposed to the herbicide glyphosate-Roundup(®).	Interdisciplinary toxicology (2012), Vol. 5, No. 3, pp. 133	5.4.1 case b) Relevant but supplementary information: Gavaged formulated product, effects not attributable to glyphosate.
409	CA 5.3	Larsen K. et al.	2014	Effects of Sublethal Exposure to a Glyphosate-Based Herbicide Formulation on Metabolic Activities of Different Xenobiotic-Metabolizing Enzymes in Rats.	International journal of toxicology (2014), Vol. 33, No. 4, pp. 307	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo via drinking water (Roundup FULL II, 662 g/L potassium salt). Non-representative formulation for EU.
432	CA 5.3	Lieshchova M. A. et al.	2018	Combined effect of glyphosphate, saccharin and sodium benzoate on rats.	Regulatory Mechanisms in Biosystems (2018), Vol. 9, No. 4, pp. 591	5.4.1 case b) Relevant but supplementary information: Substantially lower water consumption in glyphosate only group confounds data and makes endpoint comparisons meaningless.
535	CA 5.3	Rebai O. et al.	2017	Morus alba leaf extract mediates neuroprotection against glyphosate-induced toxicity and biochemical alterations in the brain.	Environmental science and pollution research international (2017), Vol. 24, No. 10, pp. 9605	5.4.1 case b) Relevant but supplementary information: Formulation administered via i.p. injection (described as a commercial formulation registered in the Tunisian Ministry of Agriculture).
606	CA 5.3	Tizhe E. V. et al.	2014	Influence of zinc supplementation on histopathological changes in the stomach, liver, kidney, brain, pancreas and spleen during subchronic exposure of Wistar rats to glyphosate.	Comparative clinical pathology (2014), Vol. 23, No. 5, pp. 1535	5.4.1 case b) Relevant but supplementary information: Formulation tested (Bushfire, Monsanto Europe, 360 g/L glyphosate; 441 g/L potassium salt). Non-representative formulation for EU.
607	CA 5.3	Tizhe E. V. et al.	2013	Haematogical changes induced by subchronic glyphosate exposure: ameliorative effect of zinc in Wistar rats.	Sokoto Journal of Veterinary Sciences (2013), Vol. 11, No. 2, pp. 28	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Bushfire, 441 g/L potassium salt, 360 g/L a.e.). Non-representative formulation for EU.
196	CA 5.4	Alvarez-Moya C. et al.	2014	Comparison of the in vivo and in vitro genotoxicity of glyphosate isopropylamine salt in three different organisms.	Genetics and molecular biology (2014),Vol. 37, No. 1, pp. 105	5.4.1 case b) Relevant but supplementary information: Mechanistic study without clear relevance for the risk assessment.
238	CA 5.4	Brusick D. et al.	2016	Genotoxicity Expert Panel review: weight of evidence evaluation of the genotoxicity of glyphosate, glyphosate-based formulations, and aminomethylphosphonic acid.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 56	5.4.1 case b) Relevant but supplementary information: review, secondary source.
250	CA 5.4	Carbajal-Lopez Y. et al.	2016	Biomonitoring of agricultural workers exposed to pesticide mixtures in Guerrero state, Mexico, with comet assay and micronucleus test	Environmental Science and Pollution Research (2016), Vol. 23, No. 3, pp. 2513	5.4.1 case b) Relevant but supplementary information: No glyphosate specific conclusions, confounded due to multiple pesticide uses.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
286	CA 5.4	de Castilhos Ghisi N. et al.	2016	Does exposure to glyphosate lead to an increase in the micronuclei frequency? A systematic and meta-analytic review.	Chemosphere (2016), Vol. 145, pp. 42	5.4.1 case b) Relevant but supplementary information: No new data presented, only compilation of pooled glyphosate and formulated product meta-analyses.
388	CA 5.4	Kier L. D.	2015	Review of genotoxicity biomonitoring studies of glyphosate-based formulations.	Critical reviews in toxicology (2015), Vol. 45, No. 3, pp. 209	5.4.1 case b) Relevant but supplementary information: review, secondary source
389	CA 5.4	Kier L. D. et al.	2013	Review of genotoxicity studies of glyphosate and glyphosate-based formulations.	Critical reviews in toxicology (2013), Vol. 43, No. 4, pp. 283	5.4.1 case b) Relevant but supplementary information: review, secondary source.
437	CA 5.4	Lopez Gonzalez E. C. et al.	2017	Micronuclei and other nuclear abnormalities on Caiman latirostris (Broad-snouted caiman) hatchlings after embryonic exposure to different pesticide formulations.	Ecotoxicology and environmental safety (2017), Vol. 136, pp. 84	5.4.1 case b) Relevant but supplementary information: This study looks at the impact of pesticide formulations on the nuclear developments of Caimen embryos via topical application to their eggs shells after laying. The endpoints achieved cannot be related to EU risk assessment.
543	CA 5.4	Rodrigues H. G. et al.	2011	Effects of roundup pesticide on the stability of human erythrocyte membranes and micronuclei frequency in bone marrow cells of Swiss mice	Open Biology Journal (2011), Vol. 4, pp. 54	5.4.1 case b) Relevant but supplementary information: Substance identification is missing, the study is lacking statistically and moreover, a mixed study design has been presented where the micronuclei frequency had been investigated in mice after i.p. injection.
624	CA 5.4	Vera-Candioti J. et al.	2013	Single-cell gel electrophoresis assay in the ten spotted live-bearer fish, Cnesterodon decemmaculatus (Jenyns, 1842), as bioassay for agrochemical-induced genotoxicity.	Ecotoxicology and environmental safety (2013), Vol. 98, pp. 368	5.4.1 case b) Relevant but supplementary information: GBHs tested on fish
183	CA 5.5	Acquavella J. et al.	2018	Corrigendum to: Glyphosate epidemiology expert panel review: a weight of evidence systematic review of the relationship between glyphosate exposure and non-Hodgkin's lymphoma or multiple myeloma.	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 898	5.4.1 case b) Relevant but supplementary information: Corrigendum to Acquavella et al._2016, Critical Reviews in Toxicology (2016), Vol. 46, sup1, pp. 28-43.
200	CA 5.5	Anon.	2018	Expression of Concern (26 September 2018): An Independent Review of the Carcinogenic Potential of Glyphosate.	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 981	5.4.1 case b) Relevant but supplementary information: Expression of concern regarding articles Williams et al_2016, Crit Rev Toxicol (2016), 46(S1):3-20 and Solomon et al._2016, Crit Rev Toxicol (2016), 46(S1):21-27 and Acquavella et al_2016, Crit Rev Toxicol (2016), 46(S1):28-43 and Willliams et al._2016, Crit Rev Toxicol (2016), 46(S1):44-55. and Brusick et al_2016, Crit Rev Toxicol (2016), 46(S1):56-74.
202	CA 5.5	Arjo G. et al.	2013	Plurality of opinion, scientific discourse and pseudoscience: an in depth analysis of the Seralini et al. study claiming that Roundup® Ready corn or the herbicide Roundup® cause cancer in rats.	Transgenic research (2013), Vol. 22, No. 2, pp. 255	5.4.1 case b) Relevant but supplementary information: Discussion providing context to a controversial retracted publication.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
220	CA 5.5	Bashir S. et al.	2012	Final review of the Seralini et al. (2012a) publication on a 2-year rodent feeding study with glyphosate formulations and GM maize NK603 as published online on 19 September 2012 in Food and Chemical Toxicology	EFSA Journal (2012), Vol. 10, No. 11, pp. 2986	5.4.1 case b) Relevant but supplementary information: EFSA review of Seralini chronic rat study.
221	CA 5.5	Bashir S. et al.	2012	Review of the Seralini et al. (2012) publication on a 2-year rodent feeding study with glyphosate formulations and GM maize NK603 as published online on 19 September 2012 in Food and Chemical Toxicology	EFSA Journal (2012), Vol. 10, No. 10, pp. 2910	5.4.1 case b) Relevant but supplementary information: EFSA review of Seralini chronic rat study.
226	CA 5.5	Berry C.	2018	The complexities of regulatory toxicology	Outlooks on Pest Management (2018), Vol. 29, No. 6, pp. 270	5.4.1 case b) Relevant but supplementary information: No new data presented.
227	CA 5.5	Berry C.	2013	Comments on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 430	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol. (2012), retracted
239	CA 5.5	Brusick D. et al.	2018	Corrigendum to: Genotoxicity Expert Panel review: weight of evidence evaluation of the genotoxicity of glyphosate, glyphosate-based formulations, and aminomethylphosphonic acid.	Critical Reviews in Toxicology (2018), Vol. 46, No. 10, pp 902	5.4.1 case b) Relevant but supplementary information: Corrigendum to Brusick et al._2016, Critical Reviews in Toxicology (2016), Vol. 46, sup1, pp. 56-74
240	CA 5.5	Burstyn I. et al.	2017	Visualizing the heterogeneity of effects in the analysis of associations of multiple myeloma with glyphosate use. comments on sorahan, t. multiple myeloma and glyphosate use: A re-analysis of us agricultural health study (AHS) data.	International Journal of Environmental Research and Public Health (2017), Vol. 14, No. 1, pp. 1	5.4.1 case b) Relevant but supplementary information: Re-analysis of old data, no statistically significant glyphosate findings. A re-analysis of US agricultural health study (AHS) data. Int. J. Environ. Res. Public Health (2015), Vol. 12, pp. 1548
241	CA 5.5	Bus J. S.	2017	IARC use of oxidative stress as key mode of action characteristic for facilitating cancer classification: Glyphosate case example illustrating a lack of robustness in interpretative implementation.	Regulatory toxicology and pharmacology (2017), Vol. 86, pp. 157	5.4.1 case b) Relevant but supplementary information: review, secondary source.
310	CA 5.5	Dung Le Tien et al.	2013	Comments on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 428	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
338	CA 5.5	Greim H. et al.	2015	Evaluation of carcinogenic potential of the herbicide glyphosate, drawing on tumor incidence data from fourteen chronic/carcinogenicity rodent studies.	Critical reviews in toxicology (2015), Vol. 45, No. 3, pp. 185	5.4.1 case b) Relevant but supplementary information: review, secondary source.
341	CA 5.5	Grunewald W. et al.	2013	Comment on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 447	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol. (2012), retracted

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349	CA 5.5	Hammond B. et al.	2013	A Comment on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 444	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
353	CA 5.5	Heinemann J. A.	2013	Food and chemical toxicology.	Food and Chemical Toxicology (2013), Vol. 53, pp. 442	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
378	CA 5.5	Kachuri L. et al.	2013	Multiple pesticide exposures and the risk of multiple myeloma	International Journal of Cancer (2013), Vol. 133, No. 8, pp. 1846	5.4.1 case b) Relevant but supplementary information: Exposure to multiple pesticides and a case control study which is subject to recall bias.
415	CA 5.5	Le Tien D. et al.	2013	Comments on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize"	Food and Chemical Toxicology (2013), Vol. 53, pp. 443	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
449	CA 5.5	McClellan R. O.	2016	Evaluating the potential carcinogenic hazard of glyphosate.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 1	5.4.1 case b) Relevant but supplementary information: Forward by Editor in Chief to a special edition on glyphosate in Critical Reviews in Toxicology.
451	CA 5.5	Mesnage R. et al.	2017	Multiomics reveal non-alcoholic fatty liver disease in rats following chronic exposure to an ultra-low dose of Roundup herbicide.	Scientific reports (2017), Vol. 7, pp. 39328	5.4.1 case b) Relevant but supplementary information: Formulation tested (Roundup, composition not described). Livers obtained from research of republished retreated Seralini rat study.
480	CA 5.5	Nedopitanska N. M.	2011	Problem of the carcinogenic danger of glyphosate; new data	Sovremennye Problemy Toksikologii (2011) No. 1-2, pp. 5	5.4.1 case b) Relevant but supplementary information: review, secondary source.
486	CA 5.5	Ollivier L.	2013	A Comment on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 458	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
521	CA 5.5	Portier C. J. et al.	2017	Re: Tarazona et al. (2017): Glyphosate toxicity and carcinogenicity: a review of the scientific basis of the European Union assessment and its differences with IARC.	Archives of toxicology (2017), Vol. 91, No. 9, pp. 3195	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, ref to Tarazona et al._2017, Archives of toxicology (2017), Vol. 91, No. 8, pp. 2723-2743.
540	CA 5.5	Resnik D. B.	2015	Retracting Inconclusive Research: Lessons from the Seralini GM Maize Feeding Study	Journal of agricultural & environmental ethics (2015), Vol. 28, No. 4, pp. 621	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
561	CA 5.5	Schinasi L. et al.	2014	Non-Hodgkin lymphoma and occupational exposure to agricultural pesticide chemical groups and active ingredients: a systematic review and meta-analysis.	International journal of environmental research and public health (2014), Vol. 11, No. 4, pp. 4449	5.4.1 case b) Relevant but supplementary information: This paper concerns a meta-analysis where the results were taken from available studies at face value. The authors had no way to correct for recall bias, confounding, etc. As the meta-RRs of the studies included are in error the meta-analyses are also in error. The study is considered unreliable.
564	CA 5.5	Seralini G-E. et al.	2013	Answers to critics: Why there is a long term toxicity due to a Roundup-tolerant genetically modified maize and to a Roundup herbicide	Food and Chemical Toxicology (2013), Vol. 53, pp. 476	5.4.1 case b) Relevant but supplementary information: Author responding to multiple Letters to the Editor.
579	CA 5.5	Solomon K. R.	2017	What is the problem with glyphosate?	Outlooks on Pest Management (2017), Vol. 28, No. 4, pp. 173	5.4.1 case b) Relevant but supplementary information: Review of IARC deficiencies.

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581	CA 5.5	Solomon K.R.	2018	Corrigendum to: Glyphosate in the general population and in applicators: a critical review of studies on exposures.	Critical Reviews in Toxicology (2018), Vol 48, No 10, pp. 896	5.4.1 case b) Relevant but supplementary information: Corrigendum to Solomon et al._2016, Critical Reviews in Toxicology (2016), 46, sup1, pp. 21-27.
585	CA 5.5	Sorahan T.	2016	Visualising and thinking and interpreting. Response to the Burstyn and de Ros comments on Sorahan "Multiple myeloma and glyphosate use: A re-analysis of us agricultural health study (AHS) data".	International Journal of Environmental Research and Public Health (2016), Vol. 14, No. 1, pp. E6	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Response to Burstyn et al. on Sorahan et al._2015, Int. J. Environ. Res. Public Health (2015), Vol. 12, pp. 1548-1559.
592	CA 5.5	Stipicevic S.	2017	Some organophosphate insecticides and herbicides	Arhiv Za Higijenu Rada i Toksikologiju (2017), Vol. 68, No. 2, pp. A10	5.4.1 case b) Relevant but supplementary information: Commentary on IARC evaluation.
600	CA 5.5	Tarazona J. V. et al.	2017	Glyphosate toxicity and carcinogenicity: a review of the scientific basis of the European Union assessment and its differences with IARC.	Archives of toxicology (2017), Vol. 91, No. 8, pp. 2723	5.4.1 case b) Relevant but supplementary information: Comparison of EU regulatory review with IARC evaluation.
601	CA 5.5	Tarazona J. V. et al.	2017	Response to the reply by C. J. Portier and P. Clausing, concerning our review "Glyphosate toxicity and carcinogenicity: a review of the scientific basis of the European Union assessment and its differences with IARC".	Archives of toxicology (2017), Vol. 91, No. 9, pp. 3199	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, ref to Portier et al_2017_Arch Toxicol (2017), Vol. 91, No. 9, pp. 3195-3197.
602	CA 5.5	Tarone R. E.	2018	On the International Agency for Research on Cancer classification of glyphosate as a probable human carcinogen	European journal of cancer prevention (2018), Vol. 27, No. 1, pp. 82	5.4.1 case b) Relevant but supplementary information: review, secondary source.
611	CA 5.5	Tribe D.	2013	Serious inadequacies regarding the pathology data presented in the paper by Seralini et al. (2012).	Food and Chemical Toxicology (2013), Vol. 53, pp. 452	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted.
634	CA 5.5	Williams G. M.	2018	Corrigendum to: Glyphosate rodent carcinogenicity bioassay expert panel review (Critical Reviews in Toxicology, (2016), 46, sup1, (44-55), 10.1080/10408444.2016.1214679)	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 914	5.4.1 case b) Relevant but supplementary information: Corrigendum to article Williams_2016, Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 4
635	CA 5.5	Williams G. M. et al.	2016	Glyphosate rodent carcinogenicity bioassay expert panel review.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 44	5.4.1 case b) Relevant but supplementary information: review, secondary source.
636	CA 5.5	Williams G. M. et al.	2018	Corrigendum: A review of the carcinogenic potential of glyphosate by four independent expert panels and comparison to the IARC assessment.	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 907	5.4.1 case b) Relevant but supplementary information: Corrigendum to: A review of the carcinogenic potential of glyphosate by four independent expert panels and comparison to the IARC assessment (Critical Reviews in Toxicology, (2016), 46, sup1, pp. 3-20.)

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182	CA 5.6	Abou-Amer W. L. et al.	2010	Teratological effects induced by three pesticides in pregnant rats	Alexandria Journal of Pharmaceutical Sciences (2010), Vol. 24, No. 1, pp. 21	5.4.1 case b) Relevant but supplementary information: Supportive only: Study is done with pesticide formulations with only one dose per pesticide treatment group established. The study contains unsufficient data, therefore supplementary only.
224	CA 5.6	Belle R. et al.	2012	Letter to the Editor: Toxicity of Roundup and glyphosate.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 4, pp. 233	5.4.1 case b) Relevant but supplementary information: Response to Letter to the Editor, comments on Williams et al_2012, J. Toxicol. nviron. Health B Crit. Rev (2012), Vol. 15, No. 1, pp. 39-96.
246	CA 5.6	Cai W. et al.	2017	Effects of glyphosate exposure on sperm concentration in rodents: A systematic review and meta-analysis.	Environmental toxicology and pharmacology (2017), Vol. 55, pp. 148	5.4.1 case b) Relevant but supplementary information: Re-evaluation of pooled literature data.
282	CA 5.6	de Almeida L. L. et al.	2017	Effects of melatonin in rats in the initial third stage of pregnancy exposed to sub-lethal doses of herbicides.	Acta histochemica (2017), Vol. 119, No. 3, pp. 220	5.4.1 case b) Relevant but supplementary information: Formulation tested at high doses of 500 mg/kg bw/day (Roundup), therefore supplementary only.
293	CA 5.6	Defarge N. et al.	2012	Letter to the Editor: Developmental and reproductive outcomes of Roundup and Glyphosate in humans and animals.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 7, pp. 433	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, reaction on Williams et al._2012, Toxicol. Environ. Health B Crit. Rev. 15(1):39-96.
299	CA 5.6	DeSesso J. M. et al.	2012	Letter to the Editor: Toxicity of Roundup and Glyphosate response.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 4, pp. 236	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, response on Belle_2012, Journal of Toxicology and Environmental Health Part B Critical Reviews, (2012) Vol. 15, No. 4, pp. 233-235.
300	CA 5.6	DeSesso J. M. et al.	2012	Comment on "Glyphosate impairs male offspring reproductive development by disrupting gonadotropin expression".	Archives of Toxicology (2012), Vol. 86, No. 11, pp. 1791	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Romano et al._2012, Arch Toxicol (2012), Vol. 86, No. 4, pp. 663-73.
301	CA 5.6	DeSesso J. M. et al.	2012	Response to the comments of Defarge and colleagues.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 7, pp. 438	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, reaction on Defarge et al._2012_Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 7, pp. 433-437.
446	CA 5.6	Manfo F. P. T. et al.	2012	Effect of agropesticides use on male reproductive function: A study on farmers in Djutitsa (Cameroon)	Environmental Toxicology (2012), Vol. 27, No. 7, pp. 423	5.4.1 case b) Relevant but supplementary information: No glyphosate specific conclusions, confounded due to multiple pesticide uses.
490	CA 5.6	Owagboriaye F. O. et al.	2017	Reproductive toxicity of Roundup herbicide exposure in male albino rat.	Experimental and toxicologic pathology (2017), Vol. 69, No. 7, pp. 461	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Roundup 441 g/L potassium salt, 360 g/L a.e.).
551	CA 5.6	Sakpa C. L. et al.	2018	Effects of glyphosate on sperm parameters and pregnancy success rate in Wistar rats.	Annals of Biomedical Sciences (2018), Vol. 17, No. 2, pp. 156	5.4.1 case b) Relevant but supplementary information: The glyphosate used is not sufficiently characterized, only two dose levels were tested and the number of animals used per dose level was too low. This publication is considered unreliable.
632	CA 5.6	Williams A. L. et al.	2012	Developmental and reproductive outcomes in humans and animals after glyphosate exposure: a critical analysis.	Journal of toxicology and environmental health. Part B, Critical reviews (2012), Vol. 15, No. 1, pp. 39	5.4.1 case b) Relevant but supplementary information: review, secondary source.

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457	CA 5.6.1	Milesi M. M. et al.	2018	Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats.	Archives of toxicology (2018), Vol. 92, No. 8, pp. 2629	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
458	CA 5.6.1	Milesi M. M. et al.	2019	Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats.	Archives of toxicology (2019), Vol. 93, No. 12, pp. 3635	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
518	CA 5.6.1	Plewis I.	2019	Comment on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats.	Archives of toxicology (2019), Vol. 93, No. 1, pp. 207	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
519	CA 5.6.1	Plewis I.	2020	Comment on response from Milesi et al. to 'Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats'.	Archives of toxicology (2020), Vol. 94, pp. 351	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
623	CA 5.6.1	Velastegui-Espin G. P. et al.	2018	Glyphosate: its use and implications for human health. El glifosato: su uso e implicaciones en la salud humana.	Journal of the Selva Andina Biosphere (2018), Vol. 6, No. 2, pp. 86	5.4.1 case b) Relevant but supplementary information: review, secondary source of information.
394	CA 5.6.2	Kimmel G. L. et al.	2013	Evaluation of developmental toxicity studies of glyphosate with attention to cardiovascular development.	Critical reviews in toxicology (2013), Vol. 43, No. 2, pp. 79	5.4.1 case b) Relevant but supplementary information: review, secondary source.
318	CA 5.7	Feldman V.	2014	Neurodevelopmental toxicity: Still more questions than answers.	The Lancet Neurology (2014), Vol. 13, No. 7, pp. 645	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Grandjean et al_2014, Lancet Neurol. 2014 Jul;13(7):648-9.
333	CA 5.7	Goldstein D. A. et al.	2014	Neurodevelopmental toxicity: Still more questions than answers.	The Lancet Neurology (2014), Vol. 13, No. 7, pp. 645	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Grandjean et al._2014, Lancet Neurol (2014), Vol. 13, No. 7, pp. 648-9.
337	CA 5.7	Grandjean P. et al.	2014	Neurodevelopmental toxicity: Still more questions than answers - Authors' response.	The Lancet Neurology (2014), Vol. 13, No. 7, pp. 648	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, author responding to multiple Letters to Editors
189	CA 5.8	Ait Bali Y. et al.	2017	Behavioral and Immunohistochemical Study of the Effects of Subchronic and Chronic Exposure to Glyphosate in Mice.	Frontiers in behavioral neuroscience (2017), Vol. 11, pp. 146	5.4.1 case b) Relevant but supplementary information: Formulation tested (Roundup, 486 g/L isopropylamine salt, 360 g/L a.e.) in vivo.
215	CA 5.8	Baier C. J. et al.	2017	Behavioral impairments following repeated intranasal glyphosate-based herbicide administration in mice.	Neurotoxicology and teratology (2017), Vol. 64, pp. 63	5.4.1 case b) Relevant but supplementary information: Formulation tested via intranasal administration.
248	CA 5.8	Caloni F. et al.	2016	Suspected poisoning of domestic animals by pesticides.	The Science of the total environment (2016), Vol. 539, pp. 331	5.4.1 case b) Relevant but supplementary information: Review article on domestic animal poisonings by pesticides.

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284	CA 5.8	de Avila R. I. et al.	2017	In vitro assessment of skin sensitization, photosensitization and phototoxicity potential of commercial glyphosate-containing formulations.	Toxicology in vitro (2017), Vol. 45, No. 3, pp. 386	5.4.1 case b) Relevant but supplementary information: Non-validated model confirms glyphosate non-sensitized & non-photosensitizer. Formulation data inconsistent in non-validated model.
294	CA 5.8	Defarge N. et al.	2016	Co-Formulants in Glyphosate-Based Herbicides Disrupt Aromatase Activity in Human Cells below Toxic Levels.	International journal of environmental research and public health (2016), Vol. 13, No. 3, pp. 264	5.4.1 case b) Relevant but supplementary information: In vitro results not significant for glyphosate vs multiple formulations or mixtures.
317	CA 5.8	Farkas E. et al.	2018	Label-free optical biosensor for real-time monitoring the cytotoxicity of xenobiotics: A proof of principle study on glyphosate.	Journal of hazardous materials (2018), Vol. 351, pp. 80	5.4.1 case b) Relevant but supplementary information: in vitro cytotoxicity assays.
339	CA 5.8	Gress S. et al.	2015	Glyphosate-based herbicides potently affect cardiovascular system in mammals: review of the literature.	Cardiovascular toxicology (2015), Vol. 15, No. 2, pp. 117	5.4.1 case b) Relevant but supplementary information: review, secondary source.
342	CA 5.8	Gui Y-X. et al.	2012	Glyphosate induced cell death through apoptotic and autophagic mechanisms.	Neurotoxicology and teratology (2012), Vol. 34, No. 3, pp. 344	5.4.1 case b) Relevant but supplementary information: Unrealistically high in vitro dosing in the mM range.
393	CA 5.8	Kim Y-h.. et al.	2013	Mixtures of glyphosate and surfactant TN20 accelerate cell death via mitochondrial damage-induced apoptosis and necrosis.	Toxicology in vitro : an international journal published in association with BIBRA (2013), Vol. 27, No. 1, pp. 191	5.4.1 case b) Relevant but supplementary information: In vitro cytotoxicity endpoints measured for glyphosate & surfactant along and in combination. No significant effects with glyphosate alone.
402	CA 5.8	Kurenbach B. et al.	2015	Sublethal exposure to commercial formulations of the herbicides dicamba, 2,4-dichlorophenoxyacetic acid, and glyphosate cause changes in antibiotic susceptibility in Escherichia coli and Salmonella enterica serovar Typhimurium.	mBio (2015), Vol. 6, No. 2, pp. E00009	5.4.1 case b) Relevant but supplementary information: Endpoints at doses tested not relevant to resides levels or to human health.
403	CA 5.8	Kwiatkowska M. et al.	2014	The effect of glyphosate, its metabolites and impurities on erythrocyte acetylcholinesterase activity.	Environmental toxicology and pharmacology (2014), Vol. 37, No. 3, pp. 1101	5.4.1 case b) Relevant but supplementary information: In vitro effects only noted at excessively high doses, 250-5000 uM.
452	CA 5.8	Mesnage R. et al.	2013	Ethoxylated adjuvants of glyphosate-based herbicides are active principles of human cell toxicity.	Toxicology (2013), Vol. 313, No. 2-3, pp. 122	5.4.1 case b) Relevant but supplementary information: Formulations, surfactants and glyphosate tested in vitro. Effects attributable to surfactant cytotoxicity.
453	CA 5.8	Mesnage R. et al.	2017	Facts and Fallacies in the Debate on Glyphosate Toxicity.	Frontiers in public health (2017), Vol. 5, pp. 316	5.4.1 case b) Relevant but supplementary information: review, secondary source.
454	CA 5.8	Mesnage R. et al.	2014	Major pesticides are more toxic to human cells than their declared active principles.	BioMed research international (2014), Vol. 2014, pp. 179691	5.4.1 case b) Relevant but supplementary information: In vitro cytotoxicity data at high doses not informative for hazard characterization.
553	CA 5.8	Saltmiras D. A. et al.	2015	Glyphosate: The Fate and Toxicology of a Herbicidal Amino Acid Derivative.	Amino Acids in Higher Plants (2015), pp. 461	5.4.1 case b) Relevant but supplementary information: Overview of glyphosate toxicology and fate data.
584	CA 5.8	Song H-Y. et al.	2012	In vitro cytotoxic effect of glyphosate mixture containing surfactants.	Journal of Korean medical science (2012), Vol. 27, No. 7, pp. 711	5.4.1 case b) Relevant but supplementary information: In vitro mixture effects only, not glyphosate alone.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
194	CA 5.8.2	Alleva R. et al.	2018	Mechanism underlying the effect of long-term exposure to low dose of pesticides on DNA integrity.	Environmental Toxicology (2018), Vol. 33, No. 4, pp. 476	5.4.1 case b) Relevant but supplementary information: Purity and source not reported. No positive control. Only one or two concentrations of glyphosate were tested. Comparisons are to untreated cells rather than negative controls. The reliability of the study is unassignable.
198	CA 5.8.2	Andreotti G. et al.	2012	The interaction between pesticide use and genetic variants involved in lipid metabolism on prostate cancer risk	Journal of Cancer Epidemiology (2012), Article ID 358076, pp 1	5.4.1 case b) Relevant but supplementary information: Mechanism of measuring toxicity is not data requirement of (EC) 1107/2009; performed in a non-relevant test model.
199	CA 5.8.2	Anifandis G. et al.	2018	The effect of glyphosate on human sperm motility and sperm DNA fragmentation	International Journal of Environmental Research and Public Health (2018), Vol. 15, No. 6, pp. 1117/1	5.4.1 case b) Relevant but supplementary information: The glyphosate used is not characterized, only one test concentration was used, no positive control was considered and the results obtained are not corroborated by in vivo regulatory reproductive toxicology studies with much higher systemic levels of glyphosate. This publication is considered unreliable.
290	CA 5.8.2	Dechartres J. et al.	2019	Glyphosate and glyphosate-based herbicide exposure during the peripartum period affects maternal brain plasticity, maternal behaviour and microbiome	Journal of Neuroendocrinology (2019), Vol. 31, pp. e12731	5.4.1 case b) Relevant but supplementary information: The glyphosate used was not sufficiently characterised, only one dose level was tested, the number of animals used per dose level was too low (n = 7) and a unreliable technique for oral dosing was employed (injection of test item in cookies). This publication is considered unreliable.
291	CA 5.8.2	Dedeke G. A. et al.	2018	Comparative Assessment on Mechanism Underlying Renal Toxicity of Commercial Formulation of Roundup Herbicide and Glyphosate Alone in Male Albino Rat.	International Journal of Toxicology (2018), Vol. 37, No. 4, pp. 285	5.4.1 case b) Relevant but supplementary information: The glyphosate used was not sufficiently characterized, the number of animals used per dose level was too low, and the conduct of the biochemical tests and the analysis of glyphosate in kidney tissue was poorly described. Moreover, the results from the testing of the oxidative stress parameters seem not reliable. This publication is considered unreliable.
328	CA 5.8.2	Gencer N. et al.	2012	In vitro effects of some herbicides and fungicides on human erythrocyte carbonic anhydrase activity	Fresenius Environmental Bulletin (2012), Vol. 21, No. 3, pp. 549	5.4.1 case b) Relevant but supplementary information: Glyphosate tested was not sufficiently characterised, the conditions of the inhibition assay are incompletely reported, no positive control was used and the statistics arenot well reported. This publication is considered unreliable.
356	CA 5.8.2	Honskii Y. I. et al.	2011	Effects of heavy metal salts and organophosphoric pesticides on protein metabolism in exposed white rats	Medichna Khimiya (2011), Vol. 13, No. 4, pp. 100	5.4.1 case b) Relevant but supplementary information: Mechanistic study without clear relevance for the risk assessment / glyphosate.
410	CA 5.8.2	Larsen K. et al.	2012	Effects of sub-lethal exposure of rats to the herbicide glyphosate in drinking water: glutathione transferase enzyme activities, levels of reduced glutathione and lipid peroxidation in liver, kidneys and small intestine.	Environmental toxicology and pharmacology (2012), Vol. 34, No. 3, pp. 811	5.4.1 case b) Relevant but supplementary information: Only 2 dose levels were used with only 4 animals per sex and per group. Effects were found on GSH in liver at sub-mg/kg bw dose levels which is not concordant with liver effects seen in regulatory toxicology studies performed at much higher dose levels. This publication is considered unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
424	CA 5.8.2	Lemma T. et al.	2019	Disruption of giant unilamellar vesicles mimicking cell membranes induced by the pesticides glyphosate and picloram	Biophysical chemistry (2019), Vol. 250, pp. 106176	5.4.1 case b) Relevant but supplementary information: Novel assays and endpoints not applicable/reliable for risk assessment.
455	CA 5.8.2	Mesnage R. et al.	2015	Potential toxic effects of glyphosate and its commercial formulations below regulatory limits.	Food and chemical toxicology (2015), Vol. 84, pp. 133	5.4.1 case b) Relevant but supplementary information: review, secondary source.
489	CA 5.8.2	Owagboriaye F. et al.	2019	Comparative studies on endogenic stress hormones, antioxidant, biochemical and hematological status of metabolic disturbance in albino rat exposed to roundup herbicide and its active ingredient glyphosate.	Environmental science and pollution research international (2019), Vol. 26, No. 14, pp. 14502	5.4.1 case b) Relevant but supplementary information: Purity not reported. Test species are not clearly and completely described. Insufficient information is given on the biochemical methods used. This publication is considered unreliable.
534	CA 5.8.2	Razi M. et al.	2012	Histological and histochemical effects of Gly-phosate on testicular tissue and function.	Iranian Journal of Reproductive Medicine (2012), Vol. 10, No. 3, pp. 181	5.4.1 case b) Relevant but supplementary information: No internationally accepted methods were used, only one dose level was considered, there was no characterisation of the test compound and the results are not corroborated by regulatory reproductive toxicity studies using much higher dose levels and longer times of exposure. This publication is considered unreliable.
537	CA 5.8.2	Ren X. et al.	2018	Effects of glyphosate on the ovarian function of pregnant mice, the secretion of hormones and the sex ratio of their fetuses.	Environmental pollution (2018), Vol. 243, No. Pt B, pp. 833	5.4.1 case b) Relevant but supplementary information: Glyphosate purity not reported. Only one dose level for glyphosate was tested (0.5% solution added to drinking water (it is unclear what actual dose was administered per day)). The number of animals used per dose level was too low. Insufficient information is given on the biochemical methods used. This publication is considered unreliable.
639	CA 5.8.2	Wrobel M. H.	2018	Glyphosate affects the secretion of regulators of uterine contractions in cows while it does not directly impair the motoric function of myometrium in vitro.	Toxicology and applied pharmacology (2018), Vol. 349, pp. 55	5.4.1 case b) Relevant but supplementary information: Glyphosate used is not sufficiently characterized and the analysis of glyphosate, hormones and prostaglandins is not sufficiently documented. This publication is considered unreliable.
666	CA 5.8.2	Zhao W. et al.	2011	Effect of glyphosate on oxidative damage of mice	Dulixue Zazhi (2011), Vol. 25, No. 5, pp. 364	5.4.1 case b) Relevant but supplementary information: No new information relevant for the risk assessment.
235	CA 5.8.3	Brennan J. C. et al.	2016	Development of a recombinant human ovarian (BG1) cell line containing estrogen receptor α and β for improved detection of estrogenic/antiestrogenic chemicals	Environmental Toxicology and Chemistry (2016), Vol. 35, No. 1, pp. 91	5.4.1 case b) Relevant but supplementary information: Limited data on glyphosate.
306	CA 5.8.3	Drasar P. et al.	2018	Glyphosate, an important endocrine disruptor Glyfosat - Dulezity endokrinni disruptor.	Diabetologie Metabolismus Endokrinologie Vyziva (2018), Vol. 21, No. 2, pp. 93	5.4.1 case b) Relevant but supplementary information: review, secondary source.
346	CA 5.8.3	Haggard D. E. et al.	2018	Erratum to High-Throughput H295R Steroidogenesis Assay: Utility as an Alternative and a Statistical Approach to Characterize Effects on Steroidogenesis.	Toxicological Sciences (2018), Vol. 164, No. 2, pp. 646	5.4.1 case b) Relevant but supplementary information: Erratum to Haggard et al._2018, Toxicological Sciences (2018), Vol. 162, No. 2, pp. 509-534.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
347	CA 5.8.3	Haggard D. E. et al.	2018	High-throughput H295R steroidogenesis assay: utility as an alternative and a statistical approach to characterize effects on steroidogenesis	Toxicological Sciences (2018), Vol. 162, No. 2, pp. 509	5.4.1 case b) Relevant but supplementary information: ToxCast data for high throughput H295R assay not available on glyphosate, presumably because it is not soluble in DMSO.
496	CA 5.8.3	Palma G.	2011	Letter to the editor regarding the article by Paganelli et al.	Chemical research in toxicology (2011), Vol. 24, No. 6, pp. 775	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, reply to Paganelli et al._2010, Chem. Res. Toxicol. (2010), Vol. 23, pp. 1586-1595.
498	CA 5.8.3	Pandey A. et al.	2015	Analysis of endocrine disruption effect of Roundup(®) in adrenal gland of male rats.	Toxicology reports (2015), Vol. 2, pp. 1075	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Roundup, 41%, India).
515	CA 5.8.3	Pinto C. L. et al.	2018	Identification of candidate reference chemicals for in vitro steroidogenesis assays	Toxicology In Vitro (2018), Vol. 47, pp. 103	5.4.1 case b) Relevant but supplementary information: review, secondary source.
587	CA 5.8.3	Sritana N. et al.	2018	Glyphosate induces growth of estrogen receptor alpha positive cholangiocarcinoma cells via non-genomic estrogen receptor/ERK1/2 signaling pathway.	Food and chemical toxicology (2018), Vol. 118, pp. 595	5.4.1 case b) Relevant but supplementary information: The results showed that glyphosate has the same potency as Estradiol (E2) when tested at extremely low concentrations.This has not been corroborated by other ED studies. This publication is considered unreliable.
665	CA 5.8.3	Zhao H. et al.	2018	Effects of Glyphosate on Testosterone Synthesis in Male Rats.	Asian Journal of Ecotoxicology (2018), Vol. 13, No. 5, pp. 242	5.4.1 case b) Relevant but supplementary information: Reporting of the experimental conditions is not complete.
217	CA 5.9	Bando H. et al.	2010	Extreme hyperkalemia in a patient with a new glyphosate potassium herbicide poisoning: report of a case.	The Japanese journal of toxicology (2010), Vol. 23, No. 3, pp. 246	5.4.1 case b) Relevant but supplementary information: This case report describes severe hyperkalemia in the setting of suicidal ingestion of potassium salt glyphosate formulations. This is not unexpected.
228	CA 5.9	Beswick E. et al.	2011	Fatal poisoning with glyphosate-surfactant herbicide.	Journal of the Intensive Care Society (2011), Vol. 12, No. 1, pp. 37	5.4.1 case b) Relevant but supplementary information: This is a case of a young man who deliberately ingested glyphosate product at home and rapidly developed multi-organ failure, culminating in death. No new observations.
264	CA 5.9	Chau A. M. T. et al.	2011	More Data on the Effect of Haemoperfusion for Acute Poisoning Is Required.	Blood Purification (2011), Vol. 31, No. 1-3, pp. 41	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Gil et al_2010, Blood Purif (2010), Vol. 30, No. 2, pp. 84-8.
350	CA 5.9	Han S. K. et al.	2010	Use of a lipid emulsion in a patient with refractory hypotension caused by glyphosate-surfactant herbicide.	Clinical toxicology (2010), Vol. 48, No. 6, pp. 566	5.4.1 case b) Relevant but supplementary information: This is a case report of a suicidal ingestion of formulated glyphosate that was treated with lipid emulsion and symptoms improved. As this is a description of medical management of a suicidal overdose, this should not impact re-registration
444	CA 5.9	Malhotra R. C. et al.	2010	Glyphosate-surfactant herbicide-induced reversible encephalopathy.	Journal of clinical neuroscience (2010), Vol. 17, No. 11, pp. 1472	5.4.1 case b) Relevant but supplementary information: This paper describes prolonged encephalopathy in a suicidal glyphosate ingestion. There is no mention of the medication that was used for sedation while the patient was intubated in the ICU. Accumulations of lorazepam and other sedatives may result in prolonged coma. In formulated glyphosate overdose with multi-organ failure it is common to sedate patients until their haemodynamics improve. As

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						this document encompasses suicidal overdose, this paper should not impact re-registration.
469	CA 5.9	Moon J. M. et al.	2010	Predicting acute complicated glyphosate intoxication in the emergency department.	Clinical toxicology (2010), Vol. 48, No. 7, pp. 718	5.4.1 case b) Relevant but supplementary information: The results of this study showed that age > 50 years, X-ray abnormalities, and ALT > 40 U/L were significant predictive factors for complications in patients with glyphosate surfactant herbicide poisoning; patients with these findings might require admission to the intensive care unit.
497	CA 5.9	Pan LiPing et al.	2016	Analysis of liver index of workers exposed to glyphosate	Journal of Environmental & Occupational Medicine (2016), Vol. 33, No. 4, pp. 380	5.4.1 case b) Relevant but supplementary information: This article examined the liver function in 345 workers exposed to glyphosate through manufacturing and 345 controls. The sample size is small, and it was claimed that there was a statitically signigicant difference between cholinesterase levels between groups. This is not related to glyphosate as it is not a cholinesterase inhibitor. It was also found that there were markers of liver pathology on ultrasound, which wouldn't be related to glyphosate as this has been extensively evaluated through GLP studies.
505	CA 5.9	Park J-S. et al.	2013	Incidence, etiology, and outcomes of rhabdomyolysis in a single terfiary referral center	Journal of Korean Medical Science (2013), Vol. 28, No. 8, pp. 1194	5.4.1 case b) Relevant but supplementary information: This article only mentions glyphosate in the reference section. One reference specifically discusses rhabdomyolysis with intramuscular injection of formulated glyphosate.
542	CA 5.9	Roberts D. M. et al.	2010	A prospective observational study of the clinical toxicology of glyphosate-containing herbicides in adults with acute self-poisoning.	Clinical toxicology (2010), Vol. 48, No. 2, pp. 129	5.4.1 case b) Relevant but supplementary information: This paper is a prospective study of outcomes of suicidal ingestions of glyphosate based herbicides. It shows that the mortality rate from overdose is 3.2%. This paper supports the idea that low-toxicity pesticides have a lower mortality rate than higher toxicity products.
560	CA 5.9	Sato C. et al.	2011	Aseptic meningitis in association with glyphosate-surfactant herbicide poisoning.	Clinical toxicology (2011), Vol. 49, No. 2, pp. 118	5.4.1 case b) Relevant but supplementary information: This article evaluates the case of a woman who presented in multi-organ failure 2 days after a formulated glyphosate overdose. Meningitis was suspected and the patient was found to have a high level of glyphosate in CSF. The claim is that glyphosate can cause aseptic meningitis and neurotoxicity. Glyphosate is hydrophilic and cannot cross cell membranes without active transport. It is well known that hypoxia and inflammatory changes can disrupt the tight junctions of the blood brain barrier which may allow passage of substances into the CSF. IL-6 is a known marker of inflammation. This is perhaps the mechanism through which they were able to measure glyphosate in the CSF. Since this paper is about a suicidal ingestion it should have no impact on re-registration.
563	CA 5.9	Seok S-J. et al.	2011	Surfactant volume is an essential element in human toxicity in acute glyphosate herbicide intoxication.	Clinical toxicology (2011), Vol. 49, No. 10, pp. 892	5.4.1 case b) Relevant but supplementary information: Results indicate that treatment of patients with acute glyphosate herbicide intoxication should take into account the volume and not the type of surfactants in herbicide formulations.
565	CA 5.9	Shaw G. M. et al.	2014	Early pregnancy agricultural pesticide exposures and risk of gastroschisis among	Birth Defects Research, Part A: Clinical and Molecular	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.

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				offspring in the San Joaquin Valley of California	Teratology (2014), Vol. 100, No. 9, pp. 686	
566	CA 5.9	Shaw W.	2017	Elevated Urinary Glyphosate and Clostridia Metabolites With Altered Dopamine Metabolism in Triplets With Autistic Spectrum Disorder or Suspected Seizure Disorder: A Case Study.	Integrative medicine (2017), Vol. 16, No. 1, pp. 50	5.4.1 case b) Relevant but supplementary information: This is a limited case study of 3 individuals, with minimal data on glyphosate exposure.
201	CA 5.9.1	Aris A.	2012	Response to comments from Monsanto scientists on our study showing detection of glyphosate and Cry1Ab in blood of women with and without pregnancy	Reproductive Toxicology (2012), Vol. 33, No. 1, pp. 122	5.4.1 case b) Relevant but supplementary information: Correspondence with no new data.
281	CA 5.9.1	Dang Q. et al.	2011	Control Effect of Occupational Hazards in Construction Project of Glyphosate Production	Chinese Journal of Public Health Engineering (2011), Vol. 10, no. 2, pp. 111	5.4.1 case b) Relevant but supplementary information: This is a paper describing the evaluation of a glyphosate production facility and a description of how to mitigate risks of exposure to the chemistries involved in glyphosate production.
334	CA 5.9.1	Goldstein D. A. et al.	2012	Comment: Aris and Leblanc "Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Townships of Quebec, Canada".	Reproductive Toxicology (2012), Vol. 33, No. 1, pp. 120	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, comments on Aris et al._2011, Reprod. Toxicol (2011), Vol. 31, pp. 528-533.
373	CA 5.9.1	Jomichen J. et al.	2017	Australian work exposures studies: occupational exposure to pesticides.	Occupational and environmental medicine (2017), Vol. 74, No. 1, pp. 46	5.4.1 case b) Relevant but supplementary information: Occupational exposure survey.
398	CA 5.9.1	Knudsen L. E. et al.	2017	Biomonitoring of Danish school children and mothers including biomarkers of PBDE and glyphosate.	Reviews on environmental health (2017), Vol. 32, No. 3, pp. 279	5.4.1 case b) Relevant but supplementary information: All glyphosate levels many orders of magnitude lower than the ADI.
456	CA 5.9.1	Mesnage R. et al.	2012	Glyphosate exposure in a farmer's family.	Journal of Environmental Protection (2012), Vol. 3, No. 9, pp. 1001	5.4.1 case b) Relevant but supplementary information: Glyphosate measured in urine of farmer and family.
459	CA 5.9.1	Mills P. J. et al.	2017	Excretion of the Herbicide Glyphosate in Older Adults Between 1993 and 2016.	Journal of the American Medical Association (2017), Vol. 318, No. 16, pp. 1610	5.4.1 case b) Relevant but supplementary information: Not relevant for EU toxicology risk assessment but supplementary information on human exposure.
460	CA 5.9.1	Mills P. J. et al.	2018	Excretion of the herbicide glyphosate in older adults between 1993 and 2016 (vol 318, pg 1610, 2017)	Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1386	5.4.1 case b) Relevant but supplementary information: Correction to Mills et al._2017, Journal of the American Medical Association (2017), Vol. 318, No. 16, pp. 1610-1611.
473	CA 5.9.1	Mueller U. et al.	2012	Comment on "Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Townships of Quebec, Canada".	Reproductive Toxicology (2012), Vol. 33, No. 3, pp. 401	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Aris et al._2011, Reprod. Toxicol (2011), Vol. 31, pp. 528-533.
657	CA 5.9.1	Zhang F. et al.	2019	Study on the effect of occupational exposure to glyphosate on blood routine.	Chinese journal of industrial hygiene and occupational diseases (2019), Vol. 37, No. 2, pp. 126	5.4.1 case b) Relevant but supplementary information: No adverse outcome identified.

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242	CA 5.9.2	Bus J. S.	2015	Analysis of Moms Across America report suggesting bioaccumulation of glyphosate in U.S. mother's breast milk: Implausibility based on inconsistency with available body of glyphosate animal toxicokinetic, human biomonitoring, and physico-chemical data.	Regulatory toxicology and pharmacology (2015), Vol. 73, No. 3, pp. 758	5.4.1 case b) Relevant but supplementary information: review, secondary source.
249	CA 5.9.2	Campuzano C. et al.	2017	Efectos de la intoxicacion por glifosato en la poblacion agricola: revision de tema	Revista CES Salud Publica (2017), Vol. 8, No. 1, pp. 121	5.4.1 case b) Relevant but supplementary information: This article claims that occupational exposure to glyphosate formulations is associated with multi-organ toxicity via suicidal ingestions and a literature review to support their claim. In suicide attempts, glyphosate based formulations are known to cause caustic injury leading to multi-organ failure. However, occupational exposures do not, nor do they lead to chronic long term effects. The Ag Health Study from 2005 & 2018 demonstrate no evidence of carcinogenicity. The Farm Family Exposure Study shows that there is minimal absorption of glyphosate in the occupational setting.
268	CA 5.9.2	Cho Y. S. et al.	2018	The qSOFA Score: A Simple and Accurate Predictor of Outcome in Patients with Glyphosate Herbicide Poisoning.	Basic & clinical pharmacology & toxicology (2018), Vol. 123, No. 5, pp. 615	5.4.1 case b) Relevant but supplementary information: This study is describing the use of a scoring system to predict severity of outcome after patients present with a formulated glyphosate overdose. This is meant to guide clinical practice and should not impact re-registration.
312	CA 5.9.2	Elsner P. et al.	2018	Occupational koebnerization of psoriasis caused by glyphosate.	Journal der Deutschen Dermatologischen Gesellschaft = Journal of the German Society of Dermatology (2018), Vol. 16, No. 1, pp. 70	5.4.1 case b) Relevant but supplementary information: There is not a mechanism for glyphosate to cause psoriasis, particularly 1 week post exposure.
314	CA 5.9.2	Eriguchi M. et al.	2019	Parkinsonism Relating to Intoxication with Glyphosate.	Internal medicine (2019), Vol. 58, No. 13, pp. 1935	5.4.1 case b) Relevant but supplementary information: (Reversible) Parkinsonism in case of acute in-toxication is a well-known effect and not specific for glyphosate.
323	CA 5.9.2	Frappart M. et al.	2011	A fatal acute poisoning with glyphosate: importance of gastrointestinal toxicity. Original title: Une intoxication aigue fatale au glyphosate : importance de la toxicite digestive.	Annales francaises d'anesthesie et de reanimation (2011), Vol. 30, No. 11, pp. 852	5.4.1 case b) Relevant but supplementary information: This case report describes caustic injury to the GI tract and multi-organ failure after formulated glyphosate overdose. The clinical course is consistent with previous reports of overdose and should not impact re-registration.
335	CA 5.9.2	Goldstein D. A. et al.	2018	Reversible Parkinsonism following glyphosate exposure.	Parkinsonism and Related Disorders (2018), Vol. 56, pp. 107	5.4.1 case b) Relevant but supplementary information: Letter ref to Zheng et al._2018, Parkinsonism Relat Disord. (2018), Vol. 56, pp.108.
369	CA 5.9.2	Jayasumana C. et al.	2014	Glyphosate, hard water and nephrotoxic metals: are they the culprits behind the epidemic of chronic kidney disease of unknown etiology in Sri Lanka?.	International journal of environmental research and public health (2014), Vol. 11, No. 2, pp. 2125	5.4.1 case b) Relevant but supplementary information: Presents a hypothesis which is not tested, only discussed.

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370	CA 5.9.2	Jayasumana C. et al.	2015	Simultaneous exposure to multiple heavy metals and glyphosate may contribute to Sri Lankan agricultural nephropathy.	BMC nephrology (2015), Vol. 16, pp. 103	5.4.1 case b) Relevant but supplementary information: Presents a hypothesis which is not tested, only discussed
382	CA 5.9.2	Karberg K. et al.	2018	Glyphosate levels in older adults.	JAMA - Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1384	5.4.1 case b) Relevant but supplementary information: Medical data which should not impact the re-registration.
387	CA 5.9.2	Khot R. et al.	2018	Glyphosate poisoning with acute fulminant hepatic failure.	Asia Pacific Journal of Medical Toxicology (2018), Vol. 7, No. 3, pp. 86	5.4.1 case b) Relevant but supplementary information: glyphosate is not hepatotoxic by any route.
408	CA 5.9.2	Langrand J. et al.	2019	Increased severity associated with tallowamine in acute glyphosate poisoning.	Clinical toxicology (2020), Vol. 58, pp. 201	5.4.1 case b) Relevant but supplementary information: In this study, severe respiratory symptoms were also more frequently reported in the TA group. The surfactant properties of POEA are likely to cause aspiration pneumonitis which is a plausible explanation for the respiratory failure complicating severe GBF poisoning cases.
422	CA 5.9.2	Lee M-J. et al.	2019	Hemodynamic changes after infusion of intravenous lipid emulsion to treat refractory hypotension caused by glyphosate-surfactant herbicide poisoning A case report.	Medicine (2019), Vol. 98, No. 3, pp. Article No.: e14156	5.4.1 case b) Relevant but supplementary information: This is an article describing the use of lipid emulsion in a suicidal overdose of formulated glyphosate. This has been well described in the literature as a possible intervention in critically ill patients.
448	CA 5.9.2	Mariager T. P. et al.	2013	Severe adverse effects related to dermal exposure to a glyphosate-surfactant herbicide.	Clinical toxicology (2013), Vol. 51, No. 2, pp. 111	5.4.1 case b) Relevant but supplementary information: No new effects are discussed in the publication. Adverse effects of formulations in case of dermal exposure are well known. The data should not impact the re-registration.
461	CA 5.9.2	Mills P. J. et al.	2018	Erratum: Excretion of the herbicide glyphosate in older adults between 1993 and 2016.	Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1386	5.4.1 case b) Relevant but supplementary information: Erratum listing undisclosed conflicts of interest on a previous paper, Mills_2017, Journal of the American Medical Association (2017), Vol. 318, No. 16, pp. 1610-1611.
462	CA 5.9.2	Mills P. J. et al.	2020	Glyphosate Excretion is Associated With Steatohepatitis and Advanced Liver Fibrosis in Patients With Fatty Liver Disease.	Clinical gastroenterology and hepatology (2020), Vol. 8, pp. 741	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment. This paper should not impact the re-registration.
463	CA 5.9.2	Mills P. J. et al.	2018	Undisclosed conflicts of interest	Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1386	5.4.1 case b) Relevant but supplementary information: Correction to Mills et al._2017, Journal of the American Medical Association 2017, Vol. 318, No. 16, pp. 1610-1611.
470	CA 5.9.2	Moon J. M. et al.	2018	Cardiovascular Effects and Fatality May Differ According to the Formulation of Glyphosate Salt Herbicide.	Cardiovascular toxicology (2018), Vol. 18, No. 1, pp. 99	5.4.1 case b) Relevant but supplementary information: Preliminary results without investigation of other factors contributing to such effects.

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483	CA 5.9.2	Niemann L. et al.	2015	A critical review of glyphosate findings in human urine samples and comparison with the exposure of operators and consumers.	Journal fuer Verbraucherschutz und Lebensmittelsicherheit/Journal of Consumer Protection and Food Safety (2015), Vol. 10, No. 1, pp. 3	5.4.1 case b) Relevant but supplementary information: review, secondary source.
495	CA 5.9.2	Palli E. et al.	2011	Rapture of the large intestine caused by severe oral glyphosate-surfactant intoxication.	The American journal of emergency medicine (2011), Vol. 29, No. 4, pp. 459	5.4.1 case b) Relevant but supplementary information: This article describes corrosive injury to the transverse colon in a suicidal ingestion of formulated glyphosate. This is known to occur in suicidal overdoses and should not impact re-registration
538	CA 5.9.2	Rendon-von Osten J. et al.	2017	Glyphosate Residues in Groundwater, Drinking Water and Urine of Subsistence Farmers from Intensive Agriculture Localities: A Survey in Hopelchen, Campeche, Mexico.	International journal of environmental research and public health (2017), Vol. 14, No. 6, pp. E595	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.
568	CA 5.9.2	Shrestha S. et al.	2018	Incident thyroid disease in female spouses of private pesticide applicators.	Environment International (2018), Vol. 118, pp. 282	5.4.1 case b) Relevant but supplementary information: Very superficial information about exposure to specific pesticides. Limitations in assessment of potential confounding factors. Limitations in exposure and outcome information. This publication is considered unreliable.
580	CA 5.9.2	Solomon K. R.	2016	Glyphosate in the general population and in applicators: a critical review of studies on exposures.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 21	5.4.1 case b) Relevant but supplementary information: review, secondary source.
658	CA 5.9.2	Zhang F. et al.	2018	Relationships between internal and external exposure indicators of glyphosate in occupational workers.	Journal of Environmental & Occupational Medicine (2018), Vol. 35, No. 11, pp. 990	5.4.1 case b) Relevant but supplementary information: Manufacturing practices in China are not representative of EU manufacturing protocols
668	CA 5.9.2	Zheng Q. et al.	2018	Reversible Parkinsonism induced by acute exposure glyphosate.	Parkinsonism & related disorders (2018), Vol. 50, pp. 121	5.4.1 case b) Relevant but supplementary information: Reversible Parkinsonism in case of acute in-toxication is a well-known effect and not specific for glyphosate.
669	CA 5.9.2	Zheng Q. et al.	2018	Reply for the comment on "Reversible Parkinsonism induced by acute exposure glyphosate".	Parkinsonism and Related Disorders (2018), Vol. 56, pp. 108	5.4.1 case b) Relevant but supplementary information: Letter to the editor, comments on Goldstein_2018, Parkinsonism Relat Disord. (2018), Vol. 56, pp. 107
184	CA 5.9.4	Acquavella J. et al.	2016	Glyphosate epidemiology expert panel review: a weight of evidence systematic review of the relationship between glyphosate exposure and non-Hodgkin's lymphoma or multiple myeloma.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 28	5.4.1 case b) Relevant but supplementary information: review, secondary source.
208	CA 5.9.4	Avgerinou C. et al.	2017	Occupational, dietary, and other risk factors for myelodysplastic syndromes in Western Greece.	Hematology (2017), Vol. 22, No. 7, pp. 419	5.4.1 case b) Relevant but supplementary information: A case-control study with non-blind interviewers results in both potential recall bias and interviewer bias. This publication is considered unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
210	CA 5.9.4	Avila-Vazquez M. et al.	2015	Cancer and detrimental reproductive effects in an Argentine agricultural community environmentally exposed to glyphosate. Original Title: Cancer y trastornos reproductivos en una poblacion agricola argentina expuesta a glifosato.	Journal of Biological Physics and Chemistry (2015), Vol. 15, No. 3, pp. 97	5.4.1 case b) Relevant but supplementary information: There is no glyphosate use associations quantified, confounded by multiple pesticide uses, other local industry and local sanitation questions.
222	CA 5.9.4	Beard J. D. et al.	2014	Pesticide exposure and depression among male private pesticide applicators in the agricultural health study.	Environmental Health Perspectives (2014), Vol. 122, No. 9, pp. 984	5.4.1 case b) Relevant but supplementary information: No statistically significant findings for glyphosate.
223	CA 5.9.4	Beard J. D. et al.	2013	Pesticide exposure and self-reported incident depression among wives in the Agricultural Health Study	Environmental Research (2013), Vol. 126, pp. 31	5.4.1 case b) Relevant but supplementary information: No statistically significant findings for glyphosate.
243	CA 5.9.4	Caballero M. et al.	2018	Estimated Residential Exposure to Agricultural Chemicals and Premature Mortality by Parkinson's Disease in Washington State.	International journal of environmental research and public health (2018), Vol. 15, No. 12, pp. 1	5.4.1 case b) Relevant but supplementary information: Unproven exposure. Uncertain temporal relationship between purported exposure and the health outcome. Appropriate design would evaluate exposure or non-exposure from Parkinson's diagnosis and compare length of survival by exposure category.
247	CA 5.9.4	Cai W. et al.	2020	Correlation between CYP1A1 polymorphisms and susceptibility to glyphosate-induced reduction of serum cholinesterase: A case-control study of a Chinese population.	Pesticide biochemistry and physiology (2020), Vol. 162, pp. 23	5.4.1 case b) Relevant but supplementary information: Untenable assumption for the genetic analyses: that ChE depression (viz., case status) is related to glyphosate. Note that ChE depression is not more likely among those with longest glyphosate employment tenure. Adequate description of study population is uncertain. Selection process not clearly described. Adequate description of exposure circumstances is uncertain. Description of workplaces lacking. Subjects could have worked primarily in producing raw materials. This publication is considered unreliable.
263	CA 5.9.4	Chang E. T. et al.	2016	Systematic review and meta-analysis of glyphosate exposure and risk of lymphohematopoietic cancers.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2016), Vol. 51, No. 6, pp. 402	5.4.1 case b) Relevant but supplementary information: The glyphosate meta-RRs took the results from the available studies at face value. The authors had no way to correct for recall bias, confounding, etc. Therefore, the meta-RRs are in error to the extent that the studies included in the meta-analysis are also in error. Chang and Delzell (2016) are clear on this point in their meta-analysis article. Accordingly glyphosate p-values and confidence intervals for the meta-RRs cannot be taken at face value because they incorporate systematic error or bias. Thus, the argument about the statistical significance/insignificance of the meta-RR for glyphosate is negated. One cannot calculate a valid p-value when there is uncontrolled systematic error (Greenland S. Randomization, statistics, and causal inference. Epidemiology 1990; 1:421-429).
272	CA 5.9.4	Conti C. L. et al.	2018	Pesticide exposure, tobacco use, poor self-perceived health and presence of chronic disease are determinants of depressive symptoms among coffee growers from Southeast Brazil	Psychiatry Research (2018), Vol. 260, pp. 187	5.4.1 case b) Relevant but supplementary information: Study is fraught with limitations including very poor statistical analysis. Outcome and exposures essentially concurrent. This publication is considered unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
276	CA 5.9.4	Cremonese C. et al.	2017	Occupational exposure to pesticides, reproductive hormone levels and sperm quality in young Brazilian men	Reproductive Toxicology (2017), Vol. 67, pp. 174	5.4.1 case b) Relevant but supplementary information: Due to exposure/outcome temporal ambiguity and failure to control for other exposures in the evaluation of specific exposures. This publication is considered unreliable.
283	CA 5.9.4	de Araujo J. S A. et al.	2016	Glyphosate and adverse pregnancy outcomes, a systematic review of observational studies.	BMC public health (2016), Vol. 16, pp. 472	5.4.1 case b) Relevant but supplementary information: review, secondary source.
320	CA 5.9.4	Fluegge K. et al.	2018	Environmental factors influencing the link between childhood ADHD and risk of adult coronary artery disease.	Medical Hypotheses (2018), Vol. 110, pp. 83	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.
321	CA 5.9.4	Fluegge K. et al.	2016	Glyphosate Use Predicts Healthcare Utilization for ADHD in the Healthcare Cost and Utilization Project net (HCUPnet): A Two-Way Fixed-Effects Analysis.	Polish Journal of Environmental Studies (2016), Vol. 25, No. 4, pp. 1489	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.
322	CA 5.9.4	Fortes C. et al.	2016	Occupational Exposure to Pesticides With Occupational Sun Exposure Increases the Risk for Cutaneous Melanoma	Journal of occupational and environmental medicine (2016), Vol. 58, No. 4, pp. 370	5.4.1 case b) Relevant but supplementary information: No specific analyses for glyphosate. Interviewers were not blinded. Recall bias may produce spurious positive associations. Confounding not addressed adequately. This publication is considered unreliable.
332	CA 5.9.4	Goldner W. S. et al.	2013	Hypothyroidism and Pesticide Use Among Male Private Pesticide Applicators in the Agricultural Health Study	Journal of Occupational and Environmental Medicine (2013), Vol. 55, No. 10, pp. 1171	5.4.1 case b) Relevant but supplementary information: No correlation between effects and glyphosate use.
355	CA 5.9.4	Henneberger P. K. et al.	2014	Exacerbation of symptoms in agricultural pesticide applicators with asthma.	International archives of occupational and environmental health (2014), Vol. 87, No. 4, pp. 423	5.4.1 case b) Relevant but supplementary information: No adverse effects correlating with glyphosate use.
358	CA 5.9.4	Hoppin J. A. et al.	2017	Pesticides are Associated with Allergic and Non-Allergic Wheeze among Male Farmers.	Environmental health perspectives (2017), Vol. 125, No. 4, pp. 535	5.4.1 case b) Relevant but supplementary information: The exposure and outcome data were concurrent, so a temporal relationship could not be established. The extraordinary number of positive statistically significant findings mitigates against interpreting any one finding as likely to be causal. This publication is considered unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
399	CA 5.9.4	Kongtip P. et al.	2019	Thyroid Hormones in Conventional and Organic Farmers in Thailand.	International journal of environmental research and public health (2019), Vol. 16, No. 15, pp. 2704	5.4.1 case b) Relevant but supplementary information: The higher incidence of thyroid disease in women (more numerous in organic farming), no data on the menopausal status of the women (change in thyroid hormones), the collection of data within dairies of the farmers may be incomplete, the exposure of farmers to pesticides prior to the study and prior to starting organic farming, and the results for glyphosate should have been examined for confounding from other pesticides that were correlated with glyphosate use. Moreover, the use rate and bioavailability (Acquavella et al. (2004) Environmental Health Perspectives Vol. 112(3), 321-326; Acquavella et al. (2006) Epidemiology, Vol. 17(1), 69-74) of glyphosate was lower than that of the other pesticides used. Since the determination of serum thyroid hormone levels is key in this study, the methods of analysis should have been better documented. This publication is considered unreliable.
413	CA 5.9.4	LaVerda N. L. et al.	2015	Pesticide Exposures and Body Mass Index (BMI) of Pesticide Applicators From the Agricultural Health Study	Journal of Toxicology and Environmental Health, Part A: Current Issues (2015), Vol. 78, No. 20, pp. 1255	5.4.1 case b) Relevant but supplementary information: No relevant endpoint for risk assessment.
416	CA 5.9.4	Lebov J. F. et al.	2015	Pesticide exposure and end-stage renal disease risk among wives of pesticide applicators in the Agricultural Health Study	Environmental Research (2015), Vol. 143, No. Part_A, pp. 198	5.4.1 case b) Relevant but supplementary information: Glyphosate was not associated with ESRD, but this study did not have the detail necessary to provide reliable information. Mostly speculative information about exposure to glyphosate and other pesticides. This publication is considered unreliable.
426	CA 5.9.4	Leon M. E. et al.	2019	Pesticide use and risk of non-Hodgkin lymphoid malignancies in agricultural cohorts from France, Norway and the USA: a pooled analysis from the AGRICOH consortium.	International journal of epidemiology (2019), Vol. 1, No. 48, pp. 1519	5.4.1 case b) Relevant but supplementary information: Due to an error prone exposure methodology and the attendant inability to control confounding. We also note that the results for the Norwegian cohort conflict with the AHS results where exposure is determined more specifically and where there is no relationship between glyphosate and DLBCL among individuals in the highest exposed quartile (≥ 108 days). This publication is considered unreliable.
434	CA 5.9.4	Ling C. et al.	2018	Prenatal Exposure to Ambient Pesticides and Preterm Birth and Term Low Birthweight in Agricultural Regions of California.	Toxics (2018), Vol. 6, No. 3, pp. E41	5.4.1 case b) Relevant but supplementary information: Unproven assumption that residence near land treated with pesticides equates to meaningful exposure. Glyphosate biomonitoring would suggest that is highly implausible. Also, residence on birth certificates is an uncertain indicator of residential proximity to treated land during pregnancy. This publication is considered unreliable.
464	CA 5.9.4	Mink P. J. et al.	2011	Epidemiologic studies of glyphosate and non-cancer health outcomes: a review.	Regulatory toxicology and pharmacology (2011), Vol. 61, No. 2, pp. 172	5.4.1 case b) Relevant but supplementary information: This is an epidemiology review article on non-cancer endpoints.
465	CA 5.9.4	Mink P. J. et al.	2012	Epidemiologic studies of glyphosate and cancer: a review.	Regulatory toxicology and pharmacology (2012), Vol. 63, No. 3, pp. 440	5.4.1 case b) Relevant but supplementary information: review, secondary source.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
466	CA 5.9.4	Mise M.	2011	Epidemiological study of glyphosate herbicide poisoning.	The Japanese journal of toxicology (2011), Vol. 24, No. 1, pp. 69	5.4.1 case b) Relevant but supplementary information: Epidemiological analysis of acute poisoning cases due to oral ingestion of glyphosate (suicide attempts), clinical symptoms such as metabolic acidosis, hyperkalemia, electrocardiogram abnormalities are known effects and should not impact the re-registration.
507	CA 5.9.4	Parks C. G. et al.	2016	Rheumatoid Arthritis in Agricultural Health Study Spouses: Associations with Pesticides and Other Farm Exposures.	Environmental health perspectives (2016), Vol. 124, No. 11, pp. 1728	5.4.1 case b) Relevant but supplementary information: Lack of information about glyphosate frequency of use and timing of use. This publication is considered unreliable.
508	CA 5.9.4	Parvez S. et al.	2018	Glyphosate exposure in pregnancy and shortened gestational length: a prospective Indiana birth cohort study	Environmental Health (2018), Vol. 17, pp. 23/1	5.4.1 case b) Relevant but supplementary information: Small study. Uncertain exposure characterization. Premature births were 1 of 5 for those with glyphosate < LOD and 1 of 66 for those with glyphosate > LOD. This suggests no evidence of glyphosate being related to preterm birth. This publication is considered unreliable.
512	CA 5.9.4	Perry M. J. et al.	2019	Historical evidence of glyphosate exposure from a US agricultural cohort	Environmental Health (2019), Vol. 18, No. 1, pp. 42	5.4.1 case b) Relevant but supplementary information: The study population, the sampling and the method of analysis along with its validation are not sufficiently documented. This publication is considered unreliable.
557	CA 5.9.4	Santos R. et al.	2019	Thyroid and reproductive hormones in relation to pesticide use in an agricultural population in Southern Brazil	Environmental Research (2019), Vol. 173, pp. 221	5.4.1 case b) Relevant but supplementary information: Insufficient information is provided on the biochemical methods used. No detailed description of the analytical methods for the measurement of hormones in serum (using a kit from Roche). This publication is considered unreliable.
569	CA 5.9.4	Shrestha S. et al.	2018	Pesticide use and incident hypothyroidism in pesticide applicators in the agricultural health study	Environmental Health Perspectives (2018), Vol. 126, No. 9, pp. 11	5.4.1 case b) Relevant but supplementary information: Self-reported outcomes, lack of biological predicate for many pesticides (including glyphosate), and failure to control for confounding by other pesticides for glyphosate and for other pesticides. This publication is considered unreliable.
576	CA 5.9.4	Slager R. E. et al.	2010	Rhinitis associated with pesticide use among private pesticide applicators in the agricultural health study	Journal of Toxicology and Environmental Health - Part A: Current Issues (2010), Vol. 73, No. 20, pp. 1382	5.4.1 case b) Relevant but supplementary information: No information on the formulations, farming practice in the given time period has been provided.
578	CA 5.9.4	Smpokou E. et al.	2019	Environmental exposures in young adults with declining kidney function in a population at risk of Mesoamerican nephropathy.	Occupational and environmental medicine (2019), Vol. 76, No. 12, pp. 920	5.4.1 case b) Relevant but supplementary information: Too little glyphosate exposure for an informative study. Many confounding exposures. Although this was described as a case control study, the authors did not calculate odds ratios. Evaluation of mean values is not a causal parameter in a case control study. This publication is considered unreliable.
629	CA 5.9.4	Wang G. et al.	2011	Parkinsonism after chronic occupational exposure to glyphosate.	Parkinsonism & related disorders (2011), Vol. 17, No. 6, pp. 486	5.4.1 case b) Relevant but supplementary information: Reversible Parkinsonism in case of acute intoxication is a well-known effect and not specific for glyphosate. No clear causal connection of chronic Parkinsonism to glyphosate from the presented results.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
637	CA 5.9.4	Williams G. M. et al.	2016	A review of the carcinogenic potential of glyphosate by four independent expert panels and comparison to the IARC assessment.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 3	5.4.1 case b) Relevant but supplementary information: review, secondary source.
655	CA 5.9.4	Zhang C. et al.	2016	Health effect of agricultural pesticide use in China: implications for the development of GM crops	Scientific reports (2016 Vol. 6, pp. 34918	5.4.1 case b) Relevant but supplementary information: Results are likely to be valid for glyphosate under the exposure circumstances of the study, however the study was not appropriately designed for assessment of chronic health effects. In particular, there were short follow-ups and limited exposure histories.
656	CA 5.9.4	Zhang C. et al.	2018	A comparison of the effects of agricultural pesticide uses on peripheral nerve conduction in China	Scientific Reports (2018), Vol. 8, No. 1, pp. 1	5.4.1 case b) Relevant but supplementary information: Results agree with biological properties of the various pesticides. However, an inappropriate design to study the potentially chronic association between nerve conduction and pesticide exposure. There was short follow-up and limited exposure histories.
659	CA 5.9.4	Zhang F. et al.	2017	Study of the effect of occupational exposure to glyphosate on hepatorenal function.	Chinese journal of preventive medicine (2017), Vol. 51, No. 7, pp. 615	5.4.1 case b) Relevant but supplementary information: Poorly described study design, methods, and analysis. This publication is considered unreliable.
661	CA 5.9.4	Zhang L. et al.	2019	Exposure to glyphosate-based herbicides and risk for non-Hodgkin lymphoma: A meta-analysis and supporting evidence	Mutation Research, Reviews in Mutation Research (2019), Vol. 781, pp. 186	5.4.1 case b) Relevant but supplementary information: Meta-analyses cannot overcome the limitations of the studies included. This publication is considered unreliable.
185	CA 5.9.5	Adams R. D. et al.	2013	The NPIS Pesticide Surveillance Project - Eye contact with pesticides: Circumstances of exposure and toxicity.	Clinical Toxicology (2013), Vol. 51, No. 4, pp. 353	5.4.1 case b) Relevant but supplementary information: This is a report describing ocular exposures to pesticides. Formulated glyphosate is expected to cause moderate conjunctivitis & irritation when the eye is exposed due to the surfactant. This should not impact re-registration.
231	CA 5.9.5	Bosak A. B. et al.	2014	Clinical presentations with different glyphosate-containing herbicides.	Journal of Medical Toxicology (2014), Vol. 10, No. 1, pp. 72	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure after suicidal ingestion of formulated glyphosate and should not impact re-registration.
237	CA 5.9.5	Brunetti R. et al.	2019	Electrocardiographic abnormalities associated with acute glyphosate toxicity.	HeartRhythm Case Rep. (2020), Vol. 6, pp. 63	5.4.1 case b) Relevant but supplementary information: This article claims that dermal exposure to a small amount of glyphosate led to cardiac arrhythmia and claims that the patient developed a Brugada syndrome & long Qt syndrome after exposure. The measured QTC in a wide-complex tracing is uninterpretable. Brugada syndrome is largely due to sodium channel block in cardiac myocytes, LQT syndrome is largely due to potassium channel block in the cardiac myoctyes. Glyphosate does neither. Moreover, glyphosate is not dermally absorbed and multiple GLP studies have shown that glyphosate is not cardiotoxic.
244	CA 5.9.5	Caganova B. et al.	2017	Caustic effects of chemicals: risk factors for complications and mortality in acute poisoning	Monatshefte fuer Chemie (2017), Vol. 148, No. 3, pp. 497	5.4.1 case b) Relevant but supplementary information: This article discusses caustic injury in suicide attempts and therefore should not impact registration decisions.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
245	CA 5.9.5	Caganova B. et al.	2017	Caustic ingestion in the elderly: influence of age on clinical outcome	Molecules (2017), Vol. 22, No. 10, pp. 1726/1	5.4.1 case b) Relevant but supplementary information: This article compares outcomes of caustic ingestions in young to elderly patients and it demonstrates that there is a higher mortality in the older group. Glyphosate is mentioned in a table where there were 9 ingestions with no fatalities in the younger group and 2 fatalities in the elderly. This article discusses suicidal ingestions of caustic substances and should therefore not impact re-registration.
254	CA 5.9.5	Carroll R. et al.	2012	Diurnal variation in probability of death following self-poisoning in Sri Lanka--evidence for chronotoxicity in humans.	International journal of epidemiology (2012), Vol. 41, No. 6, pp. 1821	5.4.1 case b) Relevant but supplementary information: This article discusses the concept of chronotoxicity in overdoses. They found no evidence of circadian effects on glyphosate overdoses. This article discusses suicidal ingestions and therefore should not impact registration decisions.
261	CA 5.9.5	Chan C-W. et al.	2016	Successful Extracorporeal Life Support in a Case of Severe Glyphosate-Surfactant Intoxication.	Critical care medicine (2016), Vol. 44, No. 1, pp. E45	5.4.1 case b) Relevant but supplementary information: This paper looked at the use of ECMO in a critically ill patient after formulated glyphosate product overdose. ECMO is sometime of utility in treating overdose patients. This paper should not impact re-registration.
265	CA 5.9.5	Chen H-H. et al.	2013	Spectrum of corrosive esophageal injury after intentional paraquat or glyphosate-surfactant herbicide ingestion.	International journal of general medicine (2013), Vol. 6, pp. 677	5.4.1 case b) Relevant but supplementary information: Ingestions of formulated glyphosate and paraquat are known to cause caustic injury which can result in respiratory and other complications. This paper should not impact the re-registration.
267	CA 5.9.5	Cho Y. et al.	2019	Serial measurement of glyphosate blood concentration in a glyphosate potassium herbicide-intoxicated patient: A case report.	The American journal of emergency medicine (2019), Vol. 37, pp 160	5.4.1 case b) Relevant but supplementary information: Measurement of glyphosate blood concentration in an intoxicated patient, no unusal findings for such a case (suicide attempt).
269	CA 5.9.5	Cho Y. S. et al.	2019	Use of qSOFA Score in Predicting the Outcomes of Patients With Glyphosate Surfactant Herbicide Poisoning Immediately Upon Arrival at the Emergency Department.	Shock (Augusta, Ga.) (2019), Vol. 51, No. 4, pp. 447	5.4.1 case b) Relevant but supplementary information: This article describes a scoring system that is widely used in intensive care and used to determine the prognosis of patients with a variety of presenting complaints. It is descriptive and helps physicians decide wheter a patient needs early ICU intervention. This article is describing a series of overdoses and should not impact re-registration
270	CA 5.9.5	Choi B. et al.	2013	Plasma lactate level may be an insufficient monitoring tool in critically ill patient: A case of ischemia modified albumin in acute glyphosate poisoning.	Toxicology Letters (2013), Vol. 221, Supp. 1, pp. S66	5.4.1 case b) Relevant but supplementary information: This is a report about measuring IMA rather than lactate as a marker of shock after suicidal ingestion of formulated glyphosate and should not impact re-registration.
289	CA 5.9.5	De Raadt W. M. et al.	2015	Acute eosinophilic pneumonia associated with glyphosate-surfactant exposure.	Sarcoidosis, vasculitis, and diffuse lung diseases : official journal of WASOG (2015), Vol. 32, No. 2, pp. 172	5.4.1 case b) Relevant but supplementary information: This article is a case report of a smoker who developed eosinophilic pneumonia after glyphosate exposure. Glyphosate is not a sensitizer as established by multiple GLP regulatory studies. Nozzle application of formulated glyphosate producess aerosols of between 200-350 microns. In humans, it takes droplets of <100 microns to cause inhalational injury. The claim that formulated glyphosate can cause inhalational injury in a setting where it isn't aspirated is not biologically plausible.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
298	CA 5.9.5	Deo S. P. et al.	2012	Accidental chemical burns of oral mucosa by herbicide.	Journal of the Nepal Medical Association (2012), Vol. 52, No. 185, pp. 40	5.4.1 case b) Relevant but supplementary information: Large ingestions of formulated glyphosate can often result in caustic injury secondary to the surfactant's detergent actions on the mucous membranes of in people who ingest them. That said, they shouldn't cause microstomia, which tends to result from much more corrosive and scarring chemicals. This should not impact re-registration.
326	CA 5.9.5	Garlich F. M. et al.	2014	Hemodialysis clearance of glyphosate following a life-threatening ingestion of glyphosate-surfactant herbicide.	Clinical toxicology (2014), Vol. 52, No. 1, pp. 66	5.4.1 case b) Relevant but supplementary information: This article discusses the sucessful use of haemodialysis in a patient who was critically ill after a forrmulated glyphosate overdose.
331	CA 5.9.5	Gil H-W. et al.	2013	Effect of intravenous lipid emulsion in patients with acute glyphosate intoxication.	Clinical toxicology (2013), Vol. 51, No. 8, pp. 767	5.4.1 case b) Relevant but supplementary information: This paper evaluated the use of lipid therapy to treat formulated glyphosate overdoses. The mortality in these overdoses is usually due to the caustic injury to the mucosa membrane from the surfactant moeity of the product. There is some evidence that lipid emulsion can decrease the toxicity of the surfactant. These are suicidal ingestions and should not impact re-registration.
352	CA 5.9.5	Hansen N. B. et al.	2013	Severe toxicity from accidental glyphosate ingestion in a child.	Clinical Toxicology (2013), Vol. 51, No. 4, pp. 354	5.4.1 case b) Relevant but supplementary information: This is a case report of an accidental ingestion of formulated glyphosate resulting in mild corrosive injury to the GI tract in a small child and should not impact re-registration.
359	CA 5.9.5	Hour B. T. et al.	2012	Herbicide roundup intoxication: successful treatment with continuous renal replacement therapy.	The American journal of medicine (2012), Vol. 125, No. 8, pp. 1	5.4.1 case b) Relevant but supplementary information: This article discusses the use of CVVD in formulated glyphosate overdoses and medical management of suicidal ingestions and therefore should not impact registration decisions
360	CA 5.9.5	Indirakshi J. et al.	2017	Toxic Epidermal Necrolysis and Acute Kidney Injury due to Glyphosate Ingestion.	Indian journal of critical care medicine (2017), Vol. 21, No. 3, pp. 167	5.4.1 case b) Relevant but supplementary information: Glyphosate based formulations are not known to cause TEN which is a t-cell mediated type IV hypersensitivity reaction. >1% of glyphosate is absorbed through the skin and large ingestions have caustic effects on th GI tract which can result in mult-iorgan failure.
363	CA 5.9.5	Iwai K. et al.	2014	Utility of upper gastrointestinal endoscopy for management of patients with roundup poisoning.	Journal of Clinical Toxicology (2014), Vol. 4, No. 6, pp. 1	5.4.1 case b) Relevant but supplementary information: This article discusses the use of endoscopy to treat formulated glyphosate overdose and medical management of suicidal ingestions and therefore should not impact registration decisions.
374	CA 5.9.5	Jovic-Stosic J. et al.	2013	Lipid emulsion in treatment of cardiovascular collapse in acute poisoning.	Clinical Toxicology (2013), Vol. 51, No. 4, pp. 288.	5.4.1 case b) Relevant but supplementary information: This is a case series that included one patient with a formulated glyphosate overdose and treatment with ILE. This describes medical management of overdoses and should not impact re-registration.
375	CA 5.9.5	Jovic-Stosic J. et al.	2016	Intravenous lipid emulsion in treatment of cardiocirculatory disturbances caused by glyphosate-surfactant herbicide poisoning.	Vojnosanitetski pregled (2016), Vol. 73, No. 4, pp. 390	5.4.1 case b) Relevant but supplementary information: Medical case of intentional ingestion. ILE has been proposed as a possible therapy for formulated glyphosate overdoses. As this was a suicide attempt, this should not impact re-registration.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
376	CA 5.9.5	Jovic-Stosic J. et al.	2016	Antidotal use of intravenous lipid emulsion: 5 years' experience in an intensive care unit.	Clinical Toxicology (2016), Vol. 54, No. 4, pp. 476.	5.4.1 case b) Relevant but supplementary information: This is a report about using ILE to treat overdoses with 1 patient who ingested formulated glyphosate. This paper should not impact re-registration.
377	CA 5.9.5	Jyoti W. et al.	2014	Esophageal perforation and death following glyphosate poisoning.	Journal of postgraduate medicine (2014), Vol. 60, No. 3, pp. 346	5.4.1 case b) Relevant but supplementary information: Formulated glyphosate can cause caustic injury to the mucosa membrane after ingestion. The esophagus is especially prone to perforation. Due to the absence of a serosa, the esophagus is notoriously difficult to repair & heal. This is not an unusual feature of caustic injury. As this was a suicide attempt, this should not impact re-registration.
379	CA 5.9.5	Kamijo Y. et al.	2016	A multicenter retrospective survey of poisoning after ingestion of herbicides containing glyphosate potassium salt or other glyphosate salts in Japan.	Clinical toxicology (2016), Vol. 54, No. 2, pp. 147	5.4.1 case b) Relevant but supplementary information: This article discusses the incidence of hyperkalemia and multi-organ failure after formulated glyphosate ingestions. Neither of these findings are surprising in the setting of potassium salt or surfactant ingestions.
380	CA 5.9.5	Kamijo Y. et al.	2012	Glyphosate-surfactant herbicide products containing glyphosate potassium salt can cause fatal hyperkalemia if ingested in massive amounts.	Clinical toxicology (2012), Vol. 50, No. 2, pp. 159	5.4.1 case b) Relevant but supplementary information: This article discusses the fact that certain glyphosate-potassium salt formulations can cause fatal hyperkalemia in overdose. This article discusses a feature of suicidal ingestions and therefore should not impact registration decisions.
383	CA 5.9.5	Kato Y.	2015	Three cases of an extreme hyperkalemia associated with glyphosate potassium herbicide poisoning	The Japanese journal of toxicology (2015), Vol. 28, No. 4, pp. 368	5.4.1 case b) Relevant but supplementary information: This article describes a case series of three patients who presented with extreme hyperkalemia after suicidal ingestion of formulated glyphosate. This is not unexpected in an ingestion involving glyphosate formulated product with potassium salts and should not affect re-registration.
384	CA 5.9.5	Kawagashira Y. et al.	2017	Vasculitic Neuropathy Following Exposure to a Glyphosate-based Herbicide.	Internal medicine (2017), Vol. 56, No. 11, pp. 1431	5.4.1 case b) Relevant but supplementary information: This article discussed the development of painful discoloration of the toes and feet four months after the patient spray applied formulated glyphosate to crops. Interestingly, the patient was taking warfarin therapeutically, which can cause the well-described "purple toe syndrome". There is not a mechanism by which sprayed formulated glyphosate can be absorbed by the skin and directly impact small vasculature or neurons in the feet.
390	CA 5.9.5	Kim E. et al.	2016	Patterns of drugs & poisons in southern area of South Korea in 2014.	Forensic Science International (2016), Vol. 269, pp. 50	5.4.1 case b) Relevant but supplementary information: This is an article describing the chemicals / pharmaceuticals that were used in fatal overdoses that were forensically evaluated at the Busan Institute of National Forensic Services. Out of 606 fatalities, agricultural chemicals were involved in 5 and glyphosate was detected in 2 of the cases.
391	CA 5.9.5	Kim Y. H. et al.	2014	Heart rate-corrected QT interval predicts mortality in glyphosate-surfactant herbicide-poisoned patients.	The American journal of emergency medicine (2014), Vol. 32, No. 3, pp. 203	5.4.1 case b) Relevant but supplementary information: This article discusses the utility of the QTc interval to predict mortality in suicidal ingestions of glyphosate-based formulation. It is not unexpected for critically ill patients to develop a long QTc.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
392	CA 5.9.5	Kim Y. H. et al.	2016	Prognostic Factors in Emergency Department Patients with Glyphosate Surfactant Intoxication: Point-of-Care Lactate Testing.	Basic & clinical pharmacology & toxicology (2016), Vol. 119, No. 6, pp. 604	5.4.1 case b) Relevant but supplementary information: This study evaluated the use of lactate as a predictor of mortality and found a statistically significant association between a serum lactate of 4.7mmol/L and mortality in formulated glyphosate overdoses. This is not surprising as caustic injury due to detergent-like surfactants will cause cell death and thereby increase lactate levels. This article discusses predictors of mortality in suicidal ingestions and therefore should not impact registration decisions.
397	CA 5.9.5	Knezevic V. et al.	2012	Early continuous dialysis in acute glyphosate-surfactant poisoning	Srpski arhiv za celokupno lekarstvo (2012), Vol. 140, No. 9-10, pp. 648	5.4.1 case b) Relevant but supplementary information: Glyphosate based formulations can cause renal injury in overdose, and the K+ formulations may result in hyperkalemia. It is therefore reasonable to start hemodialysis or hemofiltration in critically ill patients with kidney failure or hyperkalemia. As this was a suicide attempt, this should not impact re-registration.
419	CA 5.9.5	Lee B. K. et al.	2012	Continuous renal replacement therapy in a patient with cardiac arrest after glyphosate-surfactant herbicide poisoning.	Hong Kong Journal of Emergency Medicine (2012), Vol. 19, No. 3, pp. 214	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure and the use of CVVHD after suicidal ingestion of formulated glyphosate and should not impact re-registration.
420	CA 5.9.5	Lee D. H. et al.	2017	Severe glyphosate-surfactant intoxication: Successful treatment with continuous renal replacement therapy.	Hong Kong Journal of Emergency Medicine (2017), Vol. 24, No. 1, pp. 40	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure and the use of dialysis after suicidal ingestion of formulated glyphosate and should not impact re-registration.
423	CA 5.9.5	Lee W. J. et al.	2012	Incidence of acute occupational pesticide poisoning among male farmers in South Korea	American Journal of Industrial Medicine (2012), Vol. 55, No. 9, pp. 799	5.4.1 case b) Relevant but supplementary information: This article describes a survey performed to assess the incidence of pesticide poisoning in S. Korea. The researchers interviewed 1958 farmers and asked if they exhibited any of the 21 following symptoms: nausea, vomiting, diarrhoea, sore throat, runny nose, dyspnea, headache, dizziness, hyperactivity, profuse sweating, blurred vision, paresthesia, slurred speech, paralysis, chest pain, syncope, muscle weakness,skin irritation, eye irritation, lacrimation , and fatigue. Based on these answers they categorized the farmers into mild, moderate or severe occupational exposure categories. There were 26 formulated glyphosate exposures 17 mild and 9 moderate, with zero fatalities. Based on this self-reported exposure data, they made the following claim: "acute occupational pesticide poisoning was 24.7 (95% CI 22.1–27.2) per 100 male farmers, which corresponds to 209,512 cases across South Korea in 2010." This report supports the data that occupational exposure to glyphosate based products have a very low toxicity profile.
435	CA 5.9.5	Ling S. L. et al.	2018	Workplace chemical and toxin exposures reported to a Poisons Information Centre: A diverse range causing variable morbidity.	European Journal of Emergency Medicine (2018), Vol. 25, No. 2, pp. 134	5.4.1 case b) Relevant but supplementary information: This article describes the characteristics of toxin/chemical exposures reported to an Austrailian poison center. Glyphosate is mentioned in 1 table only with no description of effects.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
440	CA 5.9.5	Luo W. et al.	2019	Surgical treatment of pyloric stenosis caused by glyphosate poisoning: A case report.	Medicine (2019), Vol. 98, No. 30, pp. e16590	5.4.1 case b) Relevant but supplementary information: This article describes a case report of gastric ulceration and swelling causing pyloric obstruction in a patient who ingested formulated glyphosate. This is not unexpected as formulations contain surfactants which can cause caustic injury to the GI tract with suicidal ingestions. This should not impact re-registration.
441	CA 5.9.5	Mahendrakar K. et al.	2014	Glyphosate surfactant herbicide poisoning and management.	Indian journal of critical care medicine (2014), Vol. 18, No. 5, pp. 328	5.4.1 case b) Relevant but supplementary information: ILE has been proposed as a possible therapy for formulated glyphosate overdoses.
467	CA 5.9.5	Mohamed F. et al.	2016	Mechanism-specific injury biomarkers predict nephrotoxicity early following glyphosate surfactant herbicide (GPSH) poisoning.	Toxicology letters (2016), Vol. 258, pp. 1	5.4.1 case b) Relevant but supplementary information: This article discusses the use of biomarkers to predict kidney injury in formulated glyphosate overdose and predictors of nephrotoxicity in suicidal ingestions and therefore should not impact registration decisions.
471	CA 5.9.5	Moon J. M. et al.	2016	The characteristics of emergency department presentations related to acute herbicide or insecticide poisoning in South Korea between 2011 and 2014.	Journal of toxicology and environmental health. Part A (2016), Vol. 79, No. 11, pp. 466	5.4.1 case b) Relevant but supplementary information: This study showed a decrease in the case fatality rate of suicidal pesticide ingestions between 2011-2014 in South Korea. This clearly demonstrates that herbicides with a lower acute toxicity profile are associated with lower mortality in suicidal ingestions.
477	CA 5.9.5	Nakae H. et al.	2015	Paralytic ileus induced by glyphosate intoxication successfully treated using Kampo medicine.	Acute medicine & surgery (2015), Vol. 2, No. 3, pp. 214	5.4.1 case b) Relevant but supplementary information: This article describes alternative medicine therapies that were used to treat a Japanese woman with a paralytic ileus after glyphosate ingestion. It is not uncommon for patients in a critical care setting to develop an ileus. These tend to resolve on their own without intervention. I cannot be commented on whether this intervention increases GI motility.
478	CA 5.9.5	Nakayama T. et al.	2019	Renal cortical hypoperfusion caused by glyphosate-surfactant herbicide.	Clinical and experimental nephrology (2019), Vol. 23, No. 6, pp. 865	5.4.1 case b) Relevant but supplementary information: This was a suicidal ingestion of formulated glyphosate that resulted in poor renal perfusion & multiorgan failure. Since this was a suicidal ingestion, the outcome is not unexpected and should not impact the re-egistration.
488	CA 5.9.5	Ordonez J. et al.	2013	Non-Ethanol hyperlipasemia in toxicology consultation.	Clinical Toxicology (2013), Vol. 51, No. 7, pp. 703	5.4.1 case b) Relevant but supplementary information: This is a case series looking at the toxic causes of pancreatitis in overdose patients. One of whom had ingested formulated glyphosate. This should not imapct re-registration.
491	CA 5.9.5	Ozaki T. et al.	2017	Severe Glyphosate-Surfactant Intoxication Successfully Treated With Continuous Hemodiafiltration and Direct Hemoperfusion: Case Report.	Therapeutic apheresis and dialysis (2017), Vol. 21, No. 3, pp. 296	5.4.1 case b) Relevant but supplementary information: This article discusses the use of haemodialysis and haemofiltration in formulated glyphosate overdoses.This article discusses medical management of suicidal ingestions and therefore should not impact registration decisions.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
506	CA 5.9.5	Park S. et al.	2016	Concurrent Hemoperfusion and Hemodialysis in Patients with Acute Pesticide Intoxication.	Blood Purification (2016), Vol. 42, No. 4, pp. 329	5.4.1 case b) Relevant but supplementary information: This article describes the use of hemodialysis and hemoperfusion in pesticide overdoses. Out of 383 pesticide ingestions 110 were glyphosate formulations. Of the 80 deaths reported 12 of them were glyphosate. This article is describing a possibly beneficial modality of treating severe pesticide overdose and should not impact re-registration.
514	CA 5.9.5	Picetti E. et al.	2017	Glyphosate ingestion causing multiple organ failure: A near-fatal case report.	Acta Biomedica (2017), Vol. 88, No. 4, pp. 533	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure after suicidal ingestion of formulated glyphosate and should not impact re-registration.
517	CA 5.9.5	Planche V. et al.	2019	Acute toxic limbic encephalopathy following glyphosate intoxication.	Neurology (2019), Vol. 92, No. 11, pp. 534	5.4.1 case b) Relevant but supplementary information: This article discusses the neurologic sequelae of glyphosate ingestion. Glyphosate cannot cross the blood brain barrier. It is not neurotoxic.
545	CA 5.9.5	Rother H.	2012	Improving poisoning diagnosis and surveillance of street pesticides	SAMJ (2012), Vol. 102, No. 6, Special Iss., pp. 485	5.4.1 case b) Relevant but supplementary information: No new information included.
586	CA 5.9.5	Sribanditmongkol P. et al.	2012	Pathological and toxicological findings in glyphosate-surfactant herbicide fatality: a case report.	The American journal of forensic medicine and pathology (2012), Vol. 33, No. 3, pp. 234	5.4.1 case b) Relevant but supplementary information: Description of a case of poisoning / suicidal ingestions of formulated glyphosate cause caustic injury, it is not unusual to find ulceration and haemorrhage of the GI tract in lethal ingestions.
597	CA 5.9.5	Takeuchi I. et al.	2019	Decrease in Butyrylcholinesterase Accompanied by Intermediate-like Syndrome after Massive Ingestion of a Glyphosate-surfactant.	Internal medicine (2019), Vol. 15; No. 58, pp. 3057	5.4.1 case b) Relevant but supplementary information: Description of a poisoning case related to a surfactant, symptoms are not unusual.
604	CA 5.9.5	Thakur D. S. et al.	2014	Glyphosate poisoning with acute pulmonary edema.	Toxicology international (2014), Vol. 21, No. 3, pp. 328	5.4.1 case b) Relevant but supplementary information: This is a case report of the clinical manifestations of glyphosate-based herbicide ingestions and discusses predictors of mortality in suicidal ingestions and therefore should not impact registration decisions.
619	CA 5.9.5	Varnai V. M. et al.	2013	Report of the poison control centre for the period 1 January - 31 December 2012. Original title: Izvjesce centra za kontrolu otrovanja za razdoblje od 1. Sijecnja do 31. Prosinca 2012.	Arhiv za Higijenu Rada i Toksikologiju (2013), Vol. 64, No. 1, pp. 183	5.4.1 case b) Relevant but supplementary information: This is a report from the Croatian Poison Center documenting types of exposure reported in 2012. Of the 134 calls regarding pesticide exposure, 84 demonstrated "effects" with 9 described as "serious". Glyphosate was listed as one of the pesticides demonstrating a serious effect. There were no other details provided and there were no fatalities as a result of pesticide exposure.
621	CA 5.9.5	Veale D. J. H. et al.	2013	Toxicovigilance I: a survey of acute poisonings in South Africa based on tygerberg poison information centre data	SAMJ (2013), Vol. 103, No. 5, pp. 293	5.4.1 case b) Relevant but supplementary information: This article summarises the chemicals used in South Africa for suicide. Glyphosate is only mentioned in a table in the article as being involved in 23 cases over a 1 year period accounting for 0.9% of the overall cases reported.
625	CA 5.9.5	Vidyadhara et al.	2014	Atypical presentation of glyphosate poisoning.	Indian Journal of Critical Care Medicine (2014), Vol. 18, Suppl. 1, pp. S36.	5.4.1 case b) Relevant but supplementary information: This is a report about multiorgan failure after suicidal ingestion of formulated glyphosate and should not impact re-registration.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
628	CA 5.9.5	Wang D. et al.	2019	Successful extracorporeal membrane oxygenation support for severe acute diquat and glyphosate poisoning: A case report.	Medicine (2019), Vol. 98, No. 6., pp. e14414	5.4.1 case b) Relevant but supplementary information: This article describes using ECMO to manage a patient with multiorgan failure after formulated glyphosate and diquat ingestion. Since this is describing medical management of suicidal overdoses, it should not impact reregistration
640	CA 5.9.5	Wu C. J. et al.	2015	PiCCO interpretation for acute glyphosate intoxication with shock: Favors cardiogenic origin.	Clinical Toxicology (2015), Vol. 53, No. 4, pp. 329	5.4.1 case b) Relevant but supplementary information: This is a report regarding multiorgan failure following suicidal ingestion of formulated glyphosate and should not impact re-registration.
641	CA 5.9.5	Wu I-L. et al.	2015	Glyphosate intoxication resulting in ventricular dysrhythmias and cardiogenic shock.	Clinical Toxicology (2015), Vol. 53, No. 4, pp. 329	5.4.1 case b) Relevant but supplementary information: This is a report regarding multiorgan failure and use of ECMO following suicidal ingestion of formulated glyphosate and should not impact re-registration.
642	CA 5.9.5	Wu M-H. et al.	2015	Successful treatment with hemodialysis for acute renal failure after glyphosate poisoning: A case report.	Clinical Toxicology (2015), Vol. 53, No. 4, pp. 330	5.4.1 case b) Relevant but supplementary information: This is a report about renal failure and haemodialysis after suicidal ingestion of formulated glyphosate and should not impact re-registration.
643	CA 5.9.5	Wunnapuk K. et al.	2014	Use of a glyphosate-based herbicide-induced nephrotoxicity model to investigate a panel of kidney injury biomarkers.	Toxicology letters (2014), Vol. 225, No. 1, pp. 192	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Concentrate Roundup Weedkiller, 360 g/L isopropylamine salt, Australia) at high acute doses of 250 - 2500 mg/kg.
650	CA 5.9.5	You M-J. et al.	2015	Clostridium tertium bacteremia in a patient with glyphosate ingestion.	The American journal of case reports (2015), Vol. 16, pp. 4	5.4.1 case b) Relevant but supplementary information: This article discussed the use of haemodialysis in the management of hyperkalemia and metabolic acidosis after formulated glyphosate overdose. Haemodialysis is often used to manage refractory hyperkalemia and acidosis. This article discusses medical management of suicidal ingestions and therefore should not impact registration decisions.
652	CA 5.9.5	You Y. et al.	2012	Effect of intravenous fat emulsion therapy on glyphosate-surfactant-induced cardiovascular collapse.	The American journal of emergency medicine (2012), Vol. 30, No. 9, pp. 2097.e1	5.4.1 case b) Relevant but supplementary information: This article is discussing the efficacy of intravenous fat emulsion as therapy for formulated glyphosate overdose. This report contributes to the evidence that intravenous fat emulsion may be a useful treatment for glyphosate overdose as it may limit the toxicity associated with large surfactant ingestions. There are no RCTs for this as it is a suicidal overdose situation.
653	CA 5.9.5	Yu G. C. et al.	2017	The clinical analytics of 10 patients with acute glyphosate poisoning	Chinese journal of industrial hygiene and occupational diseases (2017), Vol. 35, No. 5, pp. 382	5.4.1 case b) Relevant but supplementary information: This is a case study describing the clinical course of 10 patients who drank formulated glyphosate. There were no long-term sequelae of ingestion, and all 10 patients survived. These were suicdal ingestions and should not impact re-registration.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
670	CA 5.9.5	Zouaoui K. et al.	2013	Determination of glyphosate and AMPA in blood and urine from humans: about 13 cases of acute intoxication.	Forensic science international (2013), Vol. 226, No. 1-3, pp. E20	5.4.1 case b) Relevant but supplementary information: This report demonstrates a link between higher blood and urine concentrations with formulated glyphosate overdoses and a poorer outcome. This is unsurprising as it reflects that patients drank a larger volume. Larger volumes of formulated product are associated with more toxicity due to the caustic nature of the surfactant, not the amount of active ingredient. All of the laboratory parameters are expected in critically ill patients. As these were suicidal ingestions, this paper should not impact re-registration.
671	CA 5.9.5	Zyoud S. H. et al.	2017	Global research production in glyphosate intoxication from 1978 to 2015: A bibliometric analysis.	Human & experimental toxicology (2017), Vol. 36, No. 10, pp. 997	5.4.1 case b) Relevant but supplementary information: This article analyzes the reports of increase in glyphosate intoxications from the early 1970s-2016. Given the increase in use over the same time period it is not surprising that there has been a increase in reporting. This should not impact re-registration.
260	CA 6.10.1	Cebotari V. et al.	2018	Content of pesticide residues in the flowers of the acacia and linden trees from the Moldavian Codri area.	Scientific Papers, Series D. Animal Science (2018), Vol. 61, No. 2, pp. 235	5.4.1 case b) Relevant but supplementary information: The publication is considered to only provide supplementary information that is not directly relevant to MRL setting and risk assessment. The residue levels found in linden flower would trigger the need for a honey residue study and cannot be used to directly estimate an MRL. The method used to determine the residues of glyphosate in flowers is not described in the publication and no validation data are provided.
418	CA 6.10.1	Ledoux M. L. et al.	2020	Penetration of glyphosate into the food supply and the incidental impact on the honey supply and bees.	Food Control (2020), Vol. 109, pp. 106859	5.4.1 case b) Relevant but supplementary information: This publication is a review and does not provide any original data, but summarizes relevant data on honey.
504	CA 6.10.1	Pareja L. et al.	2019	Evaluation of glyphosate and AMPA in honey by water extraction followed by ion chromatography mass spectrometry. A pilot monitoring study	Analytical methods (2019), Vol. 11, No. 16, pp. 2123	5.4.1 case b) Relevant but supplementary information: This is primarily an analytical method paper, but does include information on analysis of collected samples.
530	CA 6.10.1	Raimets R. et al.	2020	Pesticide residues in beehive matrices are dependent on collection time and matrix type but independent of proportion of foraged oilseed rape and agricultural land in foraging territory	Chemosphere (2020), Vol. 238, pp. 124555	5.4.1 case b) Relevant but supplementary information: The data are over-summarized. Only the percentage of samples with detectable / quantifiable residues, the median and the maximum residues are provided and it is not clear how many samples were analysed. Furthermore, it seems that the same data were already published (with more details) in a previous article (Karise R. et al., 2017). Therefore, the publication is considered to only provide supplementary information that is not directly relevant to MRL setting and risk assessment.
605	CA 6.10.1	Thompson H. M. et al.	2014	Evaluating exposure and potential effects on honeybee brood (Apis mellifera) development using glyphosate as an example.	Integrated environmental assessment and management (2014), Vol. 10, No. 3, pp. 463	5.4.1 case b) Relevant but supplementary information: No MRLs are currently set for presented commodities and these commodities are not considered for dietary risk assessment either. Therefore, the findings do not directly impact the consumer risk assessment.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
616	CA 6.10.1	Umsza-Guez M. A. et al.	2019	Herbicide determination in Brazilian propolis using high pressure liquid chromatography.	International journal of environmental health research (2019) pp. 1 (Ahead of print)	5.4.1 case b) Relevant but supplementary information: Currently no EU MRL is set for propolis and since propolis is not taken into account for dietary risk assessment in the EU. Because of that and due to the reliability of the analytical method is not clearly established the publication is considered supplementary.
610	CA 6.2.1	Tong M. et al.	2017	Uptake, Translocation, Metabolism, and Distribution of Glyphosate in Nontarget Tea Plant (Camellia sinensis L.).	Journal of agricultural and food chemistry (2017), Vol. 65, No. 35, pp. 7638	5.4.1 case b) Relevant but supplementary information: Supplementary information on the uptake and metabolism of glyphosatephoste applied in nutrient solution totea plants.
638	CA 6.2.1	Wood L. J.	2019	The presence of glyphosate in forest plants with different life strategies one year after application.	Canadian Journal of Forest Research (2019), Vol. 49, No. 6, pp. 586	5.4.1 case b) Relevant but supplementary information: In order to properly interpret the findings of the publication, it would be important to determine the residues in the non-target crops shortly after application. However, this information is only available indirectly from other studies. According to the publication : “Compared with levels detected in forest plants immediately after application by Feng and Thompson (1990), levels detected in this study are very low.” This means that the residues shortly after application were extremely high, far above the levels that may occur in non-target plants in Europe due to contamination by spray-drift. For this reason and after full text review, the publication is considered to be of limited relevance to the EU renewal dossier. It only provides supplementary information.
599	CA 6.4.2	Tongo I. et al.	2015	Human health risks associated with residual pesticide levels in edible tissues of slaughtered cattle in Benin City, Southern Nigeria.	Toxicology Reports (2015), Vol. 2, pp. 1117	5.4.1 case b) Relevant but supplementary information: Provides information on the relative residue levels in various edible cattle tissues but since the exposure of the cattle is not known no transfer factors can be derived.
266	CA 6.5.3	Chiarello M. et al.	2019	Fast analysis of glufosinate, glyphosate and its main metabolite, aminomethylphosphonic acid, in edible oils, by liquid chromatography coupled with electrospray tandem mass spectrometry.	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2019), Vol. 36, No. 9, pp. 1376	5.4.1 case b) Relevant but supplementary information: Residue analytical method. Olive oil is relevant to the uses considered for renewal in the EU. But only few real samples analysed and all showed residues < LOQ which can be predicted from the physical-chemical properties of glyphosate and AMPA.
311	CA 6.9	Ehling S. et al.	2015	Analysis of Glyphosate and Aminomethylphosphonic Acid in Nutritional Ingredients and Milk by Derivatization with Fluorenylmethyloxycarbonyl Chloride and Liquid Chromatography-Mass Spectrometry.	Journal of agricultural and food chemistry (2015), Vol. 63, No. 48, pp. 10562	5.4.1 case b) Relevant but supplementary information: Selected analysis of samples that provide confirmatory results.
366	CA 6.9	Jansons M. et al.	2018	Occurrence of glyphosate in beer from the Latvian market.	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2018), Vol. 35, No. 9, pp. 1767	5.4.1 case b) Relevant but supplementary information: Includes information on residues in beer. Not directly relevant to dietary risk assessment but provides supplemental information.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
411	CA 6.9	Larsson M. O. et al.	2017	Quantifying dietary exposure to pesticide residues using spraying journal data	Food and Chemical Toxicology (2017), Vol. 105, pp. 407	5.4.1 case b) Relevant but supplementary information: Estimate of glyphosate exposure based on spray data in DK. Supplemental to risk assessment.
412	CA 6.9	Larsson M. O. et al.	2018	Refined assessment and perspectives on the cumulative risk resulting from the dietary exposure to pesticide residues in the Danish population	Food and Chemical Toxicology (2018), Vol. 111, pp. 207	5.4.1 case b) Relevant but supplementary information: Refined dietary risk assessment for Danish population. Supplementary to DRA included in submission.
431	CA 6.9	Liao Y. et al.	2018	Validation and application of analytical method for glyphosate and glufosinate in foods by liquid chromatography-tandem mass spectrometry.	Journal of chromatography. A (2018), Vol. 1549, pp. 31	5.4.1 case b) Relevant but supplementary information: This is primarily an analytical method paper, but does include EU monitoring results on 136 food samples (only 2 residues detected).
450	CA 6.9	McQueen H. et al.	2012	Estimating maternal and prenatal exposure to glyphosate in the community setting.	International journal of hygiene and environmental health (2012), Vol. 215, No. 6, pp. 570	5.4.1 case b) Relevant but supplementary information: Study estimated dietary exposure of pregnant women to glyphosate by survey and food analysis. Exposure is well within the National Estimated Daily Intake.
522	CA 6.9	Poulsen M. E. et al.	2017	Results from the Danish monitoring programme for pesticide residues from the period 2004-2011	Food Control (2017), Vol. 74, pp. 25	5.4.1 case b) Relevant but supplementary information: Summary of EU monitoring data.
575	CA 6.9	Skretteberg L. G. et al.	2015	Pesticide residues in food of plant origin from Southeast Asia - A Nordic project	Food Control (2015), Vol. 51, pp. 225	5.4.1 case b) Relevant but supplementary information: Monitoring data that may be relevant to the actual exposure of EU consumers to glyphosate residues. But non EU data, therefore, not directly linked to the representative uses.
591	CA 6.9	Stephenson C. L. et al.	2016	An assessment of dietary exposure to glyphosate using refined deterministic and probabilistic methods.	Food and chemical toxicology (2016), Vol. 95, pp. 28	5.4.1 case b) Relevant but supplementary information: Refined dietary risk assessment.
405	CA 7.1.1, CA 7.1.2	la Cecilia D. et al.	2018	Analysis of glyphosate degradation in a soil microcosm	Environmental pollution (2018), Vol. 233, pp. 201	5.4.1 case b) Relevant but supplementary information: Factors affecting chemical and microbial degradation of glyphosate.
427	CA 7.1.1, CA 7.1.2	Li H. et al.	2016	Degradation and Isotope Source Tracking of Glyphosate and Aminomethylphosphonic Acid.	Journal of agricultural and food chemistry (2016), Vol. 64, No. 3, pp. 529	5.4.1 case b) Relevant but supplementary information: Provides information on the molecular mechanism of glyphosate degradation. No information relevant for route of degradation.
406	CA 7.1.1.1	la Cecilia D. et al.	2018	Glyphosate dispersion, degradation, and aquifer contamination in vineyards and wheat fields in the Po Valley, Italy.	Water research (2018), Vol. 146, pp. 37	5.4.1 case b) Relevant but supplementary information: Numeric model used to predict glyphosate degradation in soil layers and concentrations of glyphosate and AMPA in shallow acquifer from use of glyphosate in vineyards and wheat fields in PoValley, Italy. See Conclusions for results of interest. Since model, not directly relevant to risk assessment, supplementary only.
475	CA 7.1.1.1, CA 7.1.2.1.1	Muskus A. M. et al.	2019	Effect of temperature, pH and total organic carbon variations on microbial turnover of (13)C3(15)N-glyphosate in agricultural soil.	The Science of the total environment (2019), Vol. 658, pp. 697	5.4.1 case b) Relevant but supplementary information: Study of effect of temperature, soil pH, total organic carbon on degradation of 13C and 15N glyphosate to nonextractable residues. Study conducted in Germany. Provides supplemental information as non-extractable residues are not directly considered in the risk assessment.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
190	CA 7.1.2.1.1	Alexa E. et al.	2010	Research on the weed control degree and glyphosate soil biodegradation in apple plantations (Pioneer variety).	Analele Universitatii din Oradea, Fascicula Biologie (2010), Vol. 17, No. 1, pp. 5	5.4.1 case b) Relevant but supplementary information: Only glyphosate mineralization analyzed (measurement of 14CO2), no details on soil characteristics or experimental set-up reported.
482	CA 7.1.2.1.1	Nguyen N. K. et al.	2018	Large variation in glyphosate mineralization in 21 different agricultural soils explained by soil properties.	The Science of the total environment (2018), Vol. 627, pp. 544	5.4.1 case b) Relevant but supplementary information: Study of 21 European soils to determine factors influencing glyphosate mineralization. Exchangeable acidity identified as only univariate factor with negative correlation. NaOH extractable residues have strong negative correlation with glyphosate mineralizaiton. Doesn't fit risk assessment directly but provides useful information.
550	CA 7.1.2.1.1	Sagliker H. A.	2018	Carbon mineralisation in orange grove soils treated with different doses of glyphosate-amine salt	Journal of Environmental Protection and Ecology (2018), Vol. 19, No. 3, pp. 1102	5.4.1 case b) Relevant but supplementary information: Study demonstrates that glyphosate application at up to 4x recommended rates does not decrease carbon mineralisation in soil and in some cases increases carbon mineralisation. Data is supplementary of previously reported work.
613	CA 7.1.2.1.1	Tush D. et al.	2018	Dissipation of polyoxyethylene tallow amine (POEA) and glyphosate in an agricultural field and their co-occurrence on streambed sediments.	The Science of the total environment (2018), Vol. 636, pp. 212	5.4.1 case b) Relevant but supplementary information: Study was conducted in the US but provides data on POEA, glyphosate, and AMPA adsorption and dissipation in top 45 cm of soil and in stream bed sediments. Conclusions useful in qualitative rather than quantitative way.
225	CA 7.1.2.1.1, CA 7.1.2.1.4	Bento C. P. M. et al.	2016	Persistence of glyphosate and aminomethylphosphonic acid in loess soil under different combinations of temperature, soil moisture and light/darkness.	The Science of the total environment (2016), Vol. 572, pp. 301	5.4.1 case b) Relevant but supplementary information: Supplementary information on the rate of degradation of glyphosate and rate of formation/dissipation of AMPA in loess soil as a function of temperature, soil moisture and light/darkness.
400	CA 7.1.2.1.2	Kuhn R. et al.	2017	Identification of the Complete Photodegradation Pathway of Ethylenediaminetetra(methylenephosphonic acid) in Aqueous Solution	Clean: Soil, Air, Water (2017), Vol. 45, No. 5, pp. 1	5.4.1 case b) Relevant but supplementary information: Paper describes another source of AMPA other than glyphosate - supplemental information.
336	CA 7.1.2.1.2, CA 7.1.3.1.2, CA 7.2.1.3	Grandcoin A. et al.	2017	AminoMethylPhosphonic acid (AMPA) in natural waters: Its sources, behavior and environmental fate.	Water research (2017), Vol. 117, pp. 187	5.4.1 case b) Relevant but supplementary information: Review paper, paper does not report experimental results but it is a comprehensive review on the sources of AMPA in the environment.
532	CA 7.1.2.2.1	Rampazzo N. et al.	2013	Adsorption of glyphosate and aminomethylphosphonic acid in soils.	International Agrophysics (2013), Vol. 27, No. 2, pp. 203	5.4.1 case b) Relevant but supplementary information: The study investigates glyphosate and AMPA adsorption to 3 different soils. Iron-oxides appear to play an important role in adsorption of glyphosate and AMPA in these soils.
487	CA 7.1.3	Ololade I. A. et al.	2014	Sorption of Glyphosate on Soil Components: The Roles of Metal Oxides and Organic Materials	Soil & sediment contamination (2014), Vol. 23, No. 5, pp. 571	5.4.1 case b) Relevant but supplementary information: No new data presented, therefore supplementary. This publication is also considered unreliable.
188	CA 7.1.3.1.1	Ahmed A. A. et al.	2018	Unravelling the nature of glyphosate binding to goethite surfaces by ab initio molecular dynamics simulations.	Physical chemistry chemical physics (2018), Vol. 20, No. 3, pp. 1531	5.4.1 case b) Relevant but supplementary information: Explores possible binding mechanisms for glyphosate with three goethite surface planes (010, 001, and 100) in the presence of water. Supplementary and not directly relevant to EU risk assessment.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
204	CA 7.1.3.1.1	Arroyave J. M. et al.	2016	Effect of humic acid on the adsorption/desorption behavior of glyphosate on goethite. Isotherms and kinetics.	Chemosphere (2016), Vol. 145, pp. 34	5.4.1 case b) Relevant but supplementary information: Study of effects of humic acid (HA) on the adsorption/desorption of glyphosate (glyphosate) on goethite. Not related to efate guideline, but supplemental information on glyphosate sorption.
287	CA 7.1.3.1.1	De Geronimo E. et al.	2018	Glyphosate sorption to soils of Argentina. Estimation of affinity coefficient by pedotransfer function	Geoderma (2018), Vol. 322, pp. 140	5.4.1 case b) Relevant but supplementary information: Reports most important parameters for glyphosate adsorption. Provides equation to predict Freundlich constant Kf. Useful qualitative information but not directly relevant for risk assessment.
303	CA 7.1.3.1.1	Dollinger J. et al.	2016	Variability of glyphosate and diuron sorption capacities of ditch beds determined using new indicator-based methods.	The Science of the total environment (2016), Vol. 573, pp. 716	5.4.1 case b) Relevant but supplementary information: Supplementary information of glyphosate sorption. Sorption properties of glyphosate to the ditch-bed materials
304	CA 7.1.3.1.1	Dollinger J. et al.	2017	Using fluorescent dyes as proxies to study herbicide removal by sorption in buffer zones.	Environmental science and pollution research international (2017), Vol. 24, No. 12, pp. 11752	5.4.1 case b) Relevant but supplementary information: Soil adsoption data for glyphosate are reported but they are well within the numbers reported in the dossier. Adsorption compared to that of sulforhodamine B flourescent dye.
329	CA 7.1.3.1.1	Geng C. et al.	2015	Modeling the release of organic contaminants during compost decomposition in soil.	Chemosphere (2015), Vol. 119, pp. 423	5.4.1 case b) Relevant but supplementary information: The paper is about degradation and adsorption of glyphosate on compost and soils and the data is consistent with endpoints reported in the dosier it does not change the risk assessment.
330	CA 7.1.3.1.1	Ghafoor A. et al.	2013	Modelling pesticide sorption in the surface and subsurface soils of an agricultural catchment.	Pest management science (2013), Vol. 69, No. 8, pp. 919	5.4.1 case b) Relevant but supplementary information: Sorption of glyphosate was measured in surface and subsurface soils to test an 'extended' partitioning model that also accounts for inorganic sorbents and pH as well as organic sorbents.
340	CA 7.1.3.1.1	Gros P. et al.	2017	Glyphosate binding in soil as revealed by sorption experiments and quantum-chemical modeling.	The Science of the total environment (2017), Vol. 586, pp. 527	5.4.1 case b) Relevant but supplementary information: A multitude of binding mechanisms to clay minerals and organic colloids studied make the occurrence of free glyphosate rather unlikely but a leaching of glyphosate complexes via preferential flow path through soil and transfer to waterways rather likely.
492	CA 7.1.3.1.1	Ozbay B. et al.	2018	Sorption and desorption behaviours of 2,4-D and glyphosate in calcareous soil from Antalya, Turkey	Water and environment journal (2018), Vol. 32, No. 1, pp. 141	5.4.1 case b) Relevant but supplementary information: Test soil was selected to be representative for the region of Antalya, Turkey. The use of oven-dried soil is considered not appropriate for the risk assessment.
493	CA 7.1.3.1.1	Padilla J. T. et al.	2019	Interactions among Glyphosate and Phosphate in Soils: Laboratory Retention and Transport Studies.	Journal of environmental quality (2019), Vol. 48, No. 1, pp. 156	5.4.1 case b) Relevant but supplementary information: Study conducted with U.S. soils but shows that Kf values of glyphosate are lower in the presence of phosphate. Addition of phosphate also impacts glyphosate movement in soil columns. Kf values are in range of previously reported.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
499	CA 7.1.3.1.1	Pandey P. et al.	2019	Assessing Glyphosate and Fluridone Concentrations in Water Column and Sediment Leachate.	Frontiers in Environmental Science (2019), Vol. 7, pp. Article No.: 22	5.4.1 case b) Relevant but supplementary information: This U.S. study was aimed to improve the existing understanding of the deposition of herbicides from water column to bed sediment and leachate of herbicides from bed sediment to water column. The study was prompted by herbicide treatment of water for aquatic weeds. Results may provide useful information although not directly relevant for EU risk assessment.
503	CA 7.1.3.1.1	Paradelo M. et al.	2015	Prediction of the glyphosate sorption coefficient across two loamy agricultural fields	Geoderma (2015), Vol. 259-260, pp. 224	5.4.1 case b) Relevant but supplementary information: Study of 9 soil factors influencing glyphosate sorption in 2 different fields. Not related to an efate guideline, but supplementary information.
573	CA 7.1.3.1.1	Singh B. et al.	2014	Soil characteristics and herbicide sorption coefficients in 140 soil profiles of two irregular undulating to hummocky terrains of western Canada	Geoderma (2014), Vol. 232-234, pp. 107	5.4.1 case b) Relevant but supplementary information: Soil adsoption data for glyphosate are reported but they are well within the numbers reported in the dossier.
627	CA 7.1.3.1.1	Waiman C. V. et al.	2016	The simultaneous presence of glyphosate and phosphate at the goethite surface as seen by XPS, ATR-FTIR and competitive adsorption isotherms	Colloids and Surfaces A: Physicochemical and Engineering Aspects (2016), Vol. 498, pp. 121	5.4.1 case b) Relevant but supplementary information: The study does not investigate soil adsorption but mineral. The study does not include an endpoint relevant for the risk assessment.
630	CA 7.1.3.1.1	Wang M. et al.	2019	Montmorillonites Can Tightly Bind Glyphosate and Paraquat Reducing Toxin Exposures and Toxicity	ACS omega (2019), Vol. 4, No. 18, pp. 17702	5.4.1 case b) Relevant but supplementary information: Article provides binding properties of glyphosate to calcium and sodium montmorillonite clay. Supplementary information as clay is a soil component, not a soil.
648	CA 7.1.3.1.1	Yan W. et al.	2018	Molecular Insights into Glyphosate Adsorption to Goethite Gained from ATR-FTIR, Two-Dimensional Correlation Spectroscopy, and DFT Study.	Environmental science & technology (2018), Vol. 52, No. 4, pp. 1946	5.4.1 case b) Relevant but supplementary information: Study of molecular-level interfacial configurations and reaction mechanisms of glyphosate with iron (hydr)oxides. The influence of phosphate is also described.
667	CA 7.1.3.1.1	Zhao Y. et al.	2015	Use of Fe/Al drinking water treatment residuals as amendments for enhancing the retention capacity of glyphosate in agricultural soils.	Journal of environmental sciences (2015), Vol. 34, pp. 133	5.4.1 case b) Relevant but supplementary information: Use of Fe/Al drinking water treatment residuals (WTRs) as a soil amendment to increase glyphosate sorption and decrease desorption in soils. Supplementary information not directly related to efate guideline studies.
485	CA 7.1.3.1.1, CA 7.1.4.1.1	Okada E. et al.	2016	Adsorption and mobility of glyphosate in different soils under no-till and conventional tillage.	Geoderma (2016), Vol. 263, pp. 78	5.4.1 case b) Relevant but supplementary information: Soil adsorption data for glyphosate are reported but they are well within the numbers provided in the dossier.
447	CA 7.1.3.1.1, CA 7.2.1.3	Maqueda C. et al.	2017	Behaviour of glyphosate in a reservoir and the surrounding agricultural soils.	The Science of the total environment (2017), Vol. 593-594, pp. 787	5.4.1 case b) Relevant but supplementary information: Confirmatory data on sorption and water/sediment behaviour and natural water photolysis of glyphosate.
649	CA 7.1.3.1.1, CA 7.2.1.3	Yang Y. et al.	2018	Comparative study of glyphosate removal on goethite and magnetite: Adsorption and photo-degradation.	Chemical Engineering Journal (2018), Vol. 352, pp. 581	5.4.1 case b) Relevant but supplementary information: Study of photodegradation of glyphosate in environment by goethite and magnetite.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
206	CA 7.1.4	Aslam S. et al.	2018	Mulch of plant residues at the soil surface impact the leaching and persistence of pesticides: A modelling study from soil columns.	Journal of contaminant hydrology (2018), Vol. 214, pp. 54	5.4.1 case b) Relevant but supplementary information: Model developed to predict glyphosate degradation / movement in presence of mulch. Not an EU validated model. Experimental data used to test the model were from a previous paper.
253	CA 7.1.4	Carretta L. et al.	2019	A new rapid procedure for simultaneous determination of glyphosate and AMPA in water at sub µg/L level.	Journal of chromatography. A (2019), Vol. 1600, pp. 65	5.4.1 case b) Relevant but supplementary information: Analytical method. Analyzed runoff samples from the Po River Valley in Italy. Only ranges of values provided not individual values. Indicates glyphosate concentrations are lower in the presence of a buffer strip than without buffer strip.
315	CA 7.1.4	Exterkoetter R. et al.	2019	Potential of terracing to reduce glyphosate and AMPA surface runoff on Latosol	Journal of soils and sediments (2019), Vol. 19, No. 5, pp. 2240	5.4.1 case b) Relevant but supplementary information: Study in Brazil. Demonstrates effectiveness of terrace in reducing total mass loss of glyphosate and AMPA by reducing run-off volume. Did not reduce concentrations of glyphosate in run-off water. Potentially useful information but not directly relevant to EU risk assessment.
541	CA 7.1.4	Richards B. K. et al.	2018	Antecedent and Post-Application Rain Events Trigger Glyphosate Transport from Runoff-Prone Soils	Environmental science & technology letters (2018), Vol. 5, No. 5, pp. 249	5.4.1 case b) Relevant but supplementary information: Run-off study in New York State, USA. The proposed soil hydrologic condition in 7 days pre-spraying is important in determining degree of runoff. Conclusion from study of interest even though data not appropriate for EU risk assessment.
660	CA 7.1.4	Zhang K. et al.	2019	Can we use a simple modelling tool to validate stormwater biofilters for herbicides treatment?	Urban Water Journal (2019), Vol. 16, pp. 412	5.4.1 case b) Relevant but supplementary information: Biofilter validation model. Field validation work performed in Australia. Model may be of interest even though field data not directly relevant to the EU.
593	CA 7.1.4.1	Suleman M. et al.	2019	Laboratory simulation studies of leaching of the priority pesticides and their transformation products in soils	Journal of Animal and Plant Sciences (2019), Vol. 29, No. 4, pp. 1112	5.4.1 case b) Relevant but supplementary information: It does not follow the OECD Column Leaching Guideline (OECD 312). Rather than applying artificial rain continuously for 48 hrs as per guideline, an unspecified amount of artificial rain is applied at the end of the day to achieve 35-40 mL of leachate the following morning.
348	CA 7.1.4.1.1	Hagner M. et al.	2013	The effects of biochar, wood vinegar and plants on glyphosate leaching and degradation	European journal of soil biology (2013), Vol. 58, pp. 1	5.4.1 case b) Relevant but supplementary information: The paper investigated addition of biochar, plants, and wood vinegar to the soil in pots and reported that biochar decreased the leaching of glyphosate, it is only relevant for mechanism of sorption but not for risk assessment.
664	CA 7.1.4.1.1, CA 7.1.4.1.2, CA 7.2.1.1	Zhang W. et al.	2019	A method for determining glyphosate and its metabolite aminomethyl phosphonic acid by gas chromatography-flame photometric detection.	Journal of chromatography. A (2019), Vol. 1589, pp. 116	5.4.1 case b) Relevant but supplementary information: Primarily an analytical methods paper with examples of hydrolysis and column leaching data provided. Insufficient methodology information provided for risk assessment.
395	CA 7.1.4.3, CA 7.5	Kjaer J. et al.	2011	Reply to Comments on "Transport modes and pathways of the strongly sorbing pesticides glyphosate and pendimethalin through structured drained soils".	Chemosphere (2011), Vol. 85, No. 9, pp. 1539	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Reply to Comments on by Petersen et al_2011, Chemosphere (2011), Vol. 84. No. 4, pp. 471-479.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
513	CA 7.1.4.3, CA 7.5	Petersen C. T. et al.	2011	Comments on "Transport modes and pathways of the strongly sorbing pesticides glyphosate and pendimethalin through structured drained soils".	Chemosphere (2011), Vol. 85, No. 9, pp. 1538	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, comment on Kjaer et al_2011, Chemosphere (2011), Vol. 84, No. 4, pp. 471-479.
205	CA 7.2.1	Ascolani Y. J. et al.	2014	Abiotic degradation of glyphosate into aminomethylphosphonic acid in the presence of metals.	Journal of agricultural and food chemistry (2014), Vol. 62, No. 40, pp. 9651	5.4.1 case b) Relevant but supplementary information: The paper is about abiotic degradation of glyphosate into AMPA in the presence of metals but it does not change the risk assessment.
510	CA 7.2.1	Paudel P. et al.	2015	Birnessite-Catalyzed Degradation of Glyphosate: A Mechanistic Study Aided by Kinetics Batch Studies and NMR Spectroscopy.	Soil Science Society of America Journal (2015), Vol. 79, No. 3, pp. 815	5.4.1 case b) Relevant but supplementary information: No relevant information on environmental fate included but a new abiotic (birnessite) degradation of glyphosate is discussed.
526	CA 7.2.1.1	Qin J. et al.	2017	Potential effects of rainwater-borne H2O2 on competitive degradation of herbicides and in the presence of humic acid.	Chemosphere (2017), Vol. 170, pp. 146	5.4.1 case b) Relevant but supplementary information: Provides information on degradation of glyphosate in the presence of hydrogen peroxide, Fe2+, and humic acid and the presence of another pesticide simulating conditions found in natural waters.
371	CA 7.2.1.3	Jiang Y. et al.	2016	The role of Fe(III) on phosphate released during the photo-decomposition of organic phosphorus in deionized and natural waters.	Chemosphere (2016), Vol. 164, pp. 208	5.4.1 case b) Relevant but supplementary information: Study of the role of Fe3+ in photodegradation of glyphosate in natural water.
236	CA 7.2.2.3	Brock A. L. et al.	2019	Microbial Turnover of Glyphosate to Biomass: Utilization as Nutrient Source and Formation of AMPA and Biogenic NER in an OECD 308 Test.	Environmental science & technology (2019), Vol. 53, No. 10, pp. 5838	5.4.1 case b) Relevant but supplementary information: Uses data from another study (Wang, 2016) to test model to predict glyphosate mineralisation, degradation, and incorporation into non-extractable residues. Not directly relevant to EU risk assessment.
203	CA 7.5	Armbruster D. et al.	2019	Characterization of phosphonate-based antiscalants used in drinking water treatment plants by anion-exchange chromatography coupled to electrospray ionization time-of-flight mass spectrometry and inductively coupled plasma mass spectrometry.	Journal of chromatography A (2019), Vol. 1601, pp. 189	5.4.1 case b) Relevant but supplementary information: Article is primarily about identification of impurities in anti-scaling products used in drinking water treatment. AMPA is identified as being present in some antiscalants at concentrations from 1.9 to 157 mg/L after 10,000 fold dilution of the commercial antiscalants. Information may be used qualitatively but not directly for EU risk assessments.
207	CA 7.5	Aslam S. et al.	2015	Effect of rainfall regimes and mulch decomposition on the dissipation and leaching of S-metolachlor and glyphosate: a soil column experiment.	Pest management science (2015), Vol. 71, No. 2, pp. 278	5.4.1 case b) Relevant but supplementary information: The study describes a soil column leaching tests with glyphosate in French soils. Glyphosate recovery from the soil column at Day 0 was only 52%. This recovery in not acceptable to draw further conclusions from the study. This publication is considered unreliable.
233	CA 7.5	Boye K. et al.	2019	Long-term data from the swedish national environmental monitoring program of pesticides in surface waters	Journal of Environmental Quality (2019), Vol. 48, pp. 1109	5.4.1 case b) Relevant but supplementary information: Describes pesticide analysis data and pesticide use information available for 4 small watersheds in Sweden. Data is available elsewhere but article provides a description of methodology and sources for data.
234	CA 7.5	Braun C. et al.	2013	The load from rail wastewater. Emissions of micropollutants from rail traffic into the watershed	Aqua & Gas (2013), Vol. 93, No. 7/8, pp. 40	5.4.1 case b) Relevant but supplementary information: No new glyphosate water concentrations are presented. Using worst-case measured values, glyphosate concentrations are predicted in various size flowing water bodies.

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251	CA 7.5	Carles L. et al.	2019	Meta-analysis of glyphosate contamination in surface waters and dissipation by biofilms.	Environment international (2019), Vol. 124, pp. 284	5.4.1 case b) Relevant but supplementary information: High phosphorus concentrations in surface water can reduce complete glyphosate degradation by biofilms and favour the accumulation of AMPA in river water.
302	CA 7.5	di Guardo A. et al.	2016	A case study on monitoring glyphosate in water. Monitoraggio delle acque: il caso studio glifosate.	Informatore Agrario (2016), Vol. 72, No. 23, pp. 55	5.4.1 case b) Relevant but supplementary information: No new data presented. Describes a method for evaluating areas around monitoring stations in Lombardi region of Italy where the concentrations of glyphosate exceed the drinking water standard.
381	CA 7.5	Karasali H. et al.	2019	Investigation of the presence of glyphosate and its major metabolite AMPA in Greek soils.	Environmental science and pollution research international (2019), Vol. 26, No. 36, pp. 36308	5.4.1 case b) Relevant but supplementary information: Paper provides data on glyphosate & AMPA concentrations in Greek soils, but there is no correlating information on glyphosate rates applied or any information on soil characterization.
386	CA 7.5	Kepler R. M. et al.	2019	Soil microbial communities in diverse agroecosystems exposed to the herbicide glyphosate.	Applied and environmental microbiology (2020), Vol. 18, No. 86	5.4.1 case b) Relevant but supplementary information: Not relevant to existing endpoint but provide support that glyphosate does not have a negative impact on soil microorganisms.
396	CA 7.5	Klatyik S. et al.	2017	Dissipation of the herbicide active ingredient glyphosate in natural water samples in the presence of biofilms	International journal of environmental analytical chemistry (2017), Vol. 97, No. 10, pp. 901	5.4.1 case b) Relevant but supplementary information: The article reports glyphosate dissipation in irradiated natural water samples from European surface waters under laboratory conditions. The water was only characterised for pH and conductivity. No dark control experiments were conducted. Average results of concentration measurements are only presented as graphical plots and not discussed in detail (focus on effect of biofilms). This publication is considered unreliable.
404	CA 7.5	Kylin H.	2013	Time-integrated sampling of glyphosate in natural waters.	Chemosphere (2013), Vol. 90, No. 6, pp. 1821	5.4.1 case b) Relevant but supplementary information: Provides information on storage stability of surface water samples that can be used to evaluate results from other surface water monitoring studies.
442	CA 7.5	Maillard E. et al.	2012	Removal of dissolved pesticide mixtures by a stormwater wetland receiving runoff from a vineyard catchment: an inter-annual comparison	International journal of environmental analytical chemistry (2012), Vol. 92, No. 8, pp. 979	5.4.1 case b) Relevant but supplementary information: Confirmatory data showing storm water wetlands removed glyphosate/AMPA from agricultural runoff.
443	CA 7.5	Mailler R. et al.	2014	Biofiltration vs conventional activated sludge plants: what about priority and emerging pollutants removal?	Environmental Science and Pollution Research (2014), Vol. 21, No. 8, pp. 5379	5.4.1 case b) Relevant but supplementary information: Paper compares glyphosate removal in waste water treatment by two primary and two biological treatments.
445	CA 7.5	Mandiki S. N. M. et al.	2014	Effect of land use on pollution status and risk of fish endocrine disruption in small farmland ponds	Hydrobiologia (2014), Vol. 723, No. 1, pp. 103	5.4.1 case b) Relevant but supplementary information: Provides glyphosate concentrations in 15 Belgian ponds in different seasons and different land uses. End-points cannot be used directly in the risk assessment for the renewal of glyphosate at EU level. Only summary glyphosate concentrations available.
474	CA 7.5	Munz N. et al.	2012	Pesticide measurements in watercourses	Aqua & Gas (2012), Vol. 92, No. 11, pp. 32	5.4.1 case b) Relevant but supplementary information: Describes evaluation of concentrations of glyphosate and other PPP's and biocides from flowing water bodies of different sizes in Switzerland. Total 545 sites (32 sites for glyphosate). Only data presented is Maximum and Mean concentrations across all sites.

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476	CA 7.5	Mutzner L. et al.	2016	Model-based screening for critical wet-weather discharges related to micropollutants from urban areas.	Water research (2016), Vol. 104, pp. 547	5.4.1 case b) Relevant but supplementary information: Model to predict glyphosate concentration from storm water outlets and combined sewer overflows. Glyphosate does not exceed EQS based on conservative modeling. Not directly relevant for risk assessment but useful information.
527	CA 7.5	Quaglia G. et al.	2019	A spatial approach to identify priority areas for pesticide pollution mitigation	JOURNAL OF ENVIRONMENTAL MANAGEMENT (2019), Vol. 246, pp. 5833	5.4.1 case b) Relevant but supplementary information: This paper describes a modeling approach to assess potential risk of glyphosate loads in waterbodies but does not utilize or report measured glyphosate concentrations. Provides supplemental information but not directly relevant for glyphosate EU risk assessment.
536	CA 7.5	Reding M.-A.	2012	Letter to the editor regarding "Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid phase extraction followed by liquid chromatography coupled to tandem mass spectrometry".	Analytical and bioanalytical chemistry (2012), Vol. 404, No. 2, pp. 613	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, comments on Sanchis et al_2011, Analytical and bioanalytical chemistry (2012), Vol. 402, No. 7, pp. 2335-45.
572	CA 7.5	Silva V. et al.	2019	Pesticide residues in European agricultural soils - A hidden reality unfolded	Science of the total environment (2019), Vol. 653, pp. 1532	5.4.1 case b) Relevant but supplementary information: Analysis for glyphosate & AMPA and other pesticides in 317 soil samples from 11 EU countries. Provides inidcation of residues but no use history.
574	CA 7.5	Skeff W. et al.	2015	Glyphosate and AMPA in the estuaries of the Baltic Sea method optimization and field study.	Marine pollution bulletin (2015), Vol. 100, No. 1, pp. 577	5.4.1 case b) Relevant but supplementary information: Provides optimized analytical method and surface water monitoring results for 10 estuaries along the Baltic Sea in Germany.
577	CA 7.5	Slomberg D. L. et al.	2017	Insights into natural organic matter and pesticide characterisation and distribution in the Rhone River.	Environmental Chemistry (2017), Vol. 14, No. 1, pp. 64	5.4.1 case b) Relevant but supplementary information: Supplementary information on glyphosate detection in surface water.
588	CA 7.5	Staufer P. et al.	2012	Diffuse inflow from settlements	Aqua & Gas (2012), Vol. 92, No. 11, pp. 42	5.4.1 case b) Relevant but supplementary information: Describes modeling to predict contamination of 4 chemicals (one of which is glyphosate) in rainfall runoff and stormwater overflow discharge from WWTP outflow. Evaluates results at both the local and the Rhein River scale.
595	CA 7.5	Swartjes F. A. et al.	2020	Measures to reduce pesticides leaching into groundwater-based drinking water resources: An appeal to national and local governments, water boards and farmers	The Science of the total environment (2020), Vol. 699, pp. 134186	5.4.1 case b) Relevant but supplementary information: Does not provide new data but summarizes exceedances of >75% of 0.1 ug/L for GW abstractions used for Drinking Water. Also proposes measures to reduce pesticide concentrations in GW.
598	CA 7.5	Tang T. et al.	2017	Hysteresis and parent-metabolite analyses unravel characteristic pesticide transport mechanisms in a mixed land use catchment.	Water Research (2017), Vol. 124, pp. 663	5.4.1 case b) Relevant but supplementary information: Use of adapted hysteresis modeling to improve understanding on pesticide metabolite transport behaviours in catchments with diverse pesticide sources and complex transport mechanisms and provide a basis for effective management strategies. Provides information on other sources of AMPA (besides glyphosate degradation).

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
603	CA 7.5	Tauchnitz N. et al.	2017	Quantification of pesticide input into surface waters in a small catchment area (Querne/Weida). Quantifizierung von Pflanzenschutzmittel(PSM)-Eintraegen in Oberflaechengewaesser in einem Kleineinzugsgebiet (Querne/Weida).	Lysimeter Forschung-Moeglichkeiten und Grenzen Lysimeter research - options and limits, 9-10 May 2017, Raumberg-Gumpenstein, Austria (2017), pp. 11	5.4.1 case b) Relevant but supplementary information: Provides information on surface water sampling in Germany, but no concentrations of glyphosate reported.
608	CA 7.5	Todorovic G. R. et al.	2010	Dispersion of glyphosate in soils through erosion. Environmental Quality 4	Air, water, and soil pollution (2010), Vol. 4, pp. 15	5.4.1 case b) Relevant but supplementary information: Analysis of runoff samples from small vegetative field plots following glyphosate application and subsequent artificial rain is not expected to provide additional relevant data. Furthermore, no details of analytical methods is reported.
197	CA 8.1.4	Amaral M. J. et al.	2012	The use of a lacertid lizard as a model for reptile ecotoxicology studies - Part 1 Field demographics and morphology	Chemosphere (2012), Vol. 87, No. 7, pp. 757	5.4.1 case b) Relevant but supplementary information: This study reports results from a long term population monitoring study. The endpoints are such that it difficult to relate to an ecotox risk assessment for Annex I reneweal purposes, but is supportive from a population level perspective.
212	CA 8.1.4	Babalola O. O. et al.	2018	Comparative Early Life Stage Toxicity of the African Clawed Frog, Xenopus laevis Following Exposure to Selected Herbicide Formulations Applied to Eradicate Alien Plants in South Africa.	Archives of Environmental Contamination and Toxicology (2018), Vol. 75, No. 1, pp. 8	5.4.1 case b) Relevant but supplementary information: As the composition of the Roundup used in the test cannot be confirmed, the study must be considered as being supplementary. Original roundup contains a POEA surfactant which drives the toxicity of the product.
213	CA 8.1.4	Bach N. C. et al.	2016	Effect on the growth and development and induction of abnormalities by a glyphosate commercial formulation and its active ingredient during two developmental stages of the South-American Creole frog, Leptodactylus latrans.	Environmental science and pollution research international (2016), Vol. 23, No. 23, pp. 23959	5.4.1 case b) Relevant but supplementary information: Endpoint data presented for a formulated product other than the representative formulation for the Annex I. There are data indicated for glyphosate technical material, but this material is not identified in the materials and methods.
275	CA 8.1.4	Cothran R. D. et al.	2013	Proximity to agriculture is correlated with pesticide tolerance: evidence for the evolution of amphibian resistance to modern pesticides.	Evolutionary Applications (2013), Vol. 6, No. 5, pp. 832	5.4.1 case b) Relevant but supplementary information: Endpoints or findings are not relevant at EU level ecotox risk assessment, but may be evidence / relevant to biodiversity discussions.
324	CA 8.1.4	Fuentes L. et al.	2014	Role of sediments in modifying the toxicity of two Roundup formulations to six species of larval anurans.	Environmental toxicology and chemistry (2014), Vol. 33, No. 11, pp. 2616	5.4.1 case b) Relevant but supplementary information: No specific endpoints presented that could be used in an EU level Annex I Ecotox risk assessment.
343	CA 8.1.4	Gungordu A.	2013	Comparative toxicity of methidathion and glyphosate on early life stages of three amphibian species: Pelophylax ridibundus, Pseudepidalea viridis, and Xenopus laevis.	Aquatic toxicology (2013), Vol. 140-141, pp. 220	5.4.1 case b) Relevant but supplementary information: Endpoints for amphibians are not a data requirement for Annex I renewal in the EU, as there are no recognised guidelines.
344	CA 8.1.4	Gungordu A. et al.	2016	Integrated assessment of biochemical markers in premetamorphic tadpoles of three amphibian species exposed to glyphosate- and methidathion-based pesticides in single and combination forms.	Chemosphere (2016), Vol. 144, pp. 2024	5.4.1 case b) Relevant but supplementary information: Amphibian enzyme level based endpoints are not a data requirement for the EU level ecotox risk assessment for Annex I purposes. Endpoints cannot be directly related to the EU level Ecotox risk assessment.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
425	CA 8.1.4	Lenkowski J. R. et al.	2010	Low concentrations of atrazine, glyphosate, 2,4-dichlorophenoxyacetic acid, and triadimefon exposures have diverse effects on Xenopus laevis organ morphogenesis.	Journal of environmental sciences (2010), Vol. 22, No. 9, pp. 1305	5.4.1 case b) Relevant but supplementary information: Toxicity of glyphosate and other chemistry to amphibians to assess malformations, up to 5 mg/L. Static renewal at 24 hr in 48 hr study. Conducted in the US. No relevant endpoint generated for the glyphosate RA renewal.
525	CA 8.1.4	Puglis H. J. et al.	2011	Effects of Technical-Grade Active Ingredient vs. Commercial Formulation of Seven Pesticides in the Presence or Absence of UV Radiation on Survival of Green Frog Tadpoles	Archives of Environmental Contamination and Toxicology (2011), Vol. 60, No. 1, pp. 145	5.4.1 case b) Relevant but supplementary information: Conducted in the US, compares glyphosate a.i. and glyphosate product (and others). Study looks at toxicity to green frog tadpoles (collected from local pond and kept in aged tap water) and impact of UV radiation to see if it enhances toxicity. Application up to 5 mg/L. Findings difficult to extrapolate to the regulatory risk assessment of glyphosate.
546	CA 8.1.4	Ruamthum W. et al.	2011	Effect of glyphosate-based herbicide on acetylcholinesterase activity in tadpoles, Hoplobatrachus rugulosus.	Communications in agricultural and applied biological sciences (2011), Vol. 76, No. 4, pp. 923	5.4.1 case b) Relevant but supplementary information: Conducted in Thailand. Study to look at effect of glyphosate on enzyme activity in tadpoles (east asian bullfrog). 96 hr exposure. LC50 values generated.
626	CA 8.1.4	Vincent K. et al.	2015	The toxicity of glyphosate alone and glyphosate-surfactant mixtures to western toad (Anaxyrus boreas) tadpoles.	Environmental toxicology and chemistry (2015), Vol. 34, No. 12, pp. 2791	5.4.1 case b) Relevant but supplementary information: Approaches used are not recognised approaches, but do inform on the toxicity of glyphosate IPA salt to amphibians in the glyphosate only investigations.
631	CA 8.1.4	Weir S. M. et al.	2016	Acute toxicity and risk to lizards of rodenticides and herbicides commonly used in New Zealand.	New Zealand Journal of Ecology (2016), Vol. 40, No. 3, pp. 342	5.4.1 case b) Relevant but supplementary information: Species relevance is difficult to relate to an EU level ecotox risk assessment for Annex I.
633	CA 8.1.4	Williams B. K. et al.	2010	Larval responses of three midwestern anurans to chronic, low-dose exposures of four herbicides.	Archives of environmental contamination and toxicology (2010), Vol. 58, No. 3, pp. 819	5.4.1 case b) Relevant but supplementary information: Eggs collected from wetlands.
252	CA 8.1.5	Carrasco A. E.	2011	Reply to the letter to the editor regarding our article (Paganelli et al., 2010).	Chemical research in toxicology (2011), Vol. 24, No. 5, pp. 610	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Reply to Paganelli et al., 2010, Paganelli et al. Chem. Res. Toxicol (2010), Vol. 23, pp. 1586-1595.
494	CA 8.1.5	Paganelli A. et al.	2010	Glyphosate-based herbicides produce teratogenic effects on vertebrates by impairing retinoic acid signaling.	Chemical research in toxicology (2010), Vol. 23, No. 10, pp. 1586	5.4.1 case b) Relevant but supplementary information: Study to look at the effect of glyphosate product on the developmental effects of xenopus laevis embryos. Glyphosate injected into embryos. No relevant endpoint generated for the regulatory risk assessment of glyphosate renewal. High concentrations, unrealistic route of exposure. Conducted in Argentina.
258	CA 8.2	Cattaneo R. et al.	2011	Toxicological responses of Cyprinus carpio exposed to a commercial formulation containing glyphosate.	Bulletin of environmental contamination and toxicology (2011), Vol. 87, No. 6, pp. 597	5.4.1 case b) Relevant but supplementary information: Roundup (480 g/L contains surfactant) used up to 10 mg/L with common carp to look at impact on AChE enzyme and physiological effects. Study described well but not conducted to a guidline and the endpoints can not be extrapolated for use in the renewal of glyphosate. Conducted outside EU.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
319	CA 8.2	Filizadeh Y. et al.	2011	Toxicity determination of three sturgeon species exposed to glyphosate.	Iranian Journal of Fisheries Sciences (2011), Vol. 10, No. 3, pp. 383	5.4.1 case b) Relevant but supplementary information: LC50 generated for sturgeon species. Glyphosate products used. Guideline not mentioned but suitable methods described. Conducted in Iran.
428	CA 8.2	Li Jia et al.	2017	Acute toxicity study of glyphosate and cyhalofop-butyl to Daphnia carinata.	Acta Prataculturae Sinica (2017), Vol. 26, No. 9, pp. 148	5.4.1 case b) Relevant but supplementary information: The herbicides evaluated in the study were a 41% glyphosate isopropylamine saline water agent. The study was not conducted according to GLP and the test substance source could not be verified. The authors state that glyphosate has an obvious dose-effect relation to the moving inhibition and fatality rate of Daphnia carinatas. The routinely used concentration of the two is significantly higher than the LC50 and is strongly toxic to Daphnia carinatas. However, given the lack of standard guidelines, an unclear method design and approach, as well as challenges in interpreting the study results make reaching any conclusions arising from the study challenging at best.
429	CA 8.2	Li Jiao et al.	2010	Acute Toxicity of Eight Pesticides on the Development of Sea Urchin Embryos.	Asian Journal of Ecotoxicology (2010), Vol. 5, No. 2, pp. 255	5.4.1 case b) Relevant but supplementary information: The study of the toxicity to the sea urchin embryos, was not conducted or based on a relevant guideline. Test concentrations were from 0.1 to 50 mg/L of glyphosate technical. The relationship between EC50 and LogP values was the main discussion of the article.
524	CA 8.2	Puertolas L. et al.	2010	Evaluation of side-effects of glyphosate mediated control of giant reed (Arundo donax) on the structure and function of a nearby Mediterranean river ecosystem.	Environmental research (2010), Vol. 110, No. 6, pp. 556	5.4.1 case b) Relevant but supplementary information: The effect of the herbicide Herbolex (mixture of glyphosate isopropyl amine salts and surfactant compounds) on the structure and function of a nearby river ecosystem after application of glyphosate in the riparian vegetation was evaluated. Therefore, in situ bioassays with transplanted Daphnia magna, field collected caddis fly (Hydropsyche exocellata) and benthic macroinvertebrate structure and function were investigated. The structure of the benthic macroinvertebrate assemblages was assessed at the same time as well as two additional time-points before application (5 and two month before). Transplants with Daphnia magna were deployed at the day of application and 12 days afterwards, whereas Hydropsyche exocellata samples were collected at the day of application and 3 days afterwards. Concentration of glyphosate and the metabolite AMPA was analysed in the river water samples collected from the studied sites at the day of application and two, three and 12 days afterwards. But other chemicals were not analysed. The herbicide was applied at 2.1 kg glyphosate/ha in an area of 0.5 ha of riparian forest, but the exact place is not specified. Furthermore, no data on the weather conditions were collected which may have had an influence on the community structure. No exact biological data regarding the macroinvertebrate abundance is reported. However, as no results were reported in values reflecting agreed endpoints for the ecological risk assessment and the information is insufficient to transfer values

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						in such endpoints, the study can be considered as supportive information only.
567	CA 8.2	Shiogiri N. S. et al.	2010	Ecotoxicity of glyphosate and aterbane (R) br surfactant on guaru (Phalloceros caudimaculatus).	Acta Scientiarum Biological Sciences (2010), Vol. 32, No. 3, pp. 285	5.4.1 case b) Relevant but supplementary information: Conducted in Brazil, looking at comparison of toxicity of glyphosate products with different amounts of surfactant to different fish species and impact on electrical conductivity, dissolved oxygen and pH.
582	CA 8.2	Song H.	2010	Toxic action of acetamiprid, glyphosate and their combined pollution on Hydra magnipapillata	Anhui Nongye Kexue (2010), Vol. 38, No. 20, pp. 10811	5.4.1 case b) Relevant but supplementary information: Test species (freshwater polyp) collected from a rural pond in China. It is not clear what previous exposure the test species may have had to pesticides. It is not clear if the glyphosate is technical grade or product; the concentrations are from 0.14 to 36 mg/L.
583	CA 8.2	Song H. et al.	2010	The Single and Binary-Combined Acute Toxicities of Five Common Pesticides on Hydra Magnipapillata	Journal of Anhui Normal University (Natural Science) (2010), Vol. 33, no. 2, pp. 159	5.4.1 case b) Relevant but supplementary information: Test species (freshwater polyp) collected from rural pond in China, it is not clear what exposure the test species may have had to pesticides or other chemicals previously. It is not clear if the glyphosate is technical material or product; the concentrations are from 40 to 227 mg/L.
618	CA 8.2, CP 10.2	Usenko O. M. et al.	2010	Effect of fluorine containing herbicides on functional activity of algae	Gidrobiologicheskii Zhurnal (2010), Vol. 46, No. 1, pp. 75	5.4.1 case b) Relevant but supplementary information: Phytoplankton collected in a field in Ukraine. Unclear what exposure the test species may have had to pesticides or other chemicals previously. Test design is not specified at all. Unclear main points: acclimatisation period, application of test substance, number of replicates or cells per replicates. Unclear if result values refer to product or active igredient. No results in values which can be used for the risk assessment.
192	CA 8.2.1	Alishahi M. et al.	2019	Comparative toxicities of five herbicides on nauplii of Artemia franciscana as an ecotoxicity bioindicator.	IRANIAN JOURNAL OF FISHERIES SCIENCES (2019), Vol. 18, No. 4, pp. 716	5.4.1 case b) Relevant but supplementary information: The material and methods section lack some important information. OECD standard methods were mentioned in the publication; however, the test guideline or specific validity criteria were not specified. Furthermore, information on preparation, application of the test item or exposure conditions are missing. No results for the control group are available to put the biological effects in context. Also no mortality results for all treatment group are given. At the end of the test, an endpoint was derived, but further statistical information (assessment of statistical power, confidence intervals) are not stated. Furthermore, there was no analytical verification of test concentrations reported. The study is considered unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
193	CA 8.2.1	Alishahi M. et al.	2016	Acute toxicity evaluation of five herbicides: paraquat, 2,4-dichlorophenoxy acetic acid (2,4-D), trifluralin, glyphosite and atrazine in Luciobarbus esocinus fingerlings.	Iranian Journal of Veterinary Medicine (2016), Vol. 10, No. 4, pp. 319	5.4.1 case b) Relevant but supplementary information: Although the study was stated to have been conducted according to a recognised test guideline (OECD 203), no validity criteria was presented. The selected fish species and their approximate origin are described but environmental holding conditions (water quality) for the fish handling prior to and during the study were not included. There was limited test substance information presented, with no rationale presented for the selection of exposure concentrations. glyphosate concentrations were also not measured/confirmed during the evaluation period. Behavioural observations relating to the lethargy and swimming behaviour are not considered directly relatable to the nominal exposure concentration. The study is considered unreliable.
211	CA 8.2.1	Ayanda O. I. et al.	2015	Acute toxicity of glyphosate and paraquat to the African catfish (Clarias gariepinus, Teugels 1986) using some biochemical indicators	Tropical zoology (2015), Vol. 28, No. 4, pp. 152	5.4.1 case b) Relevant but supplementary information: The test items were not identified, therefore it is not clear what was actually tested and to which compound the effects / results can be assigned.
277	CA 8.2.1	da Cruz C. et al.	2016	Sensitivity, ecotoxicity and histopathological effects on neotropical fish exposed to glyphosate alone and associated to surfactant	Journal of Environmental Chemistry and Ecotoxicology (2016), Vol. 8, No. 3, pp. 25	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP and/or according to a recognized test guideline and there are no validity criteria presented. The authors state that glyphosate alone and in association with Aterbane® BR was classified as practically non-toxic, whereas Aterbane® BR alone was considered moderately toxic for the tested organisms. However, due to insufficient explanation of experimental set-up (e.g. test substance, test medium, statistical analysis) and lack of experimental standard procedures (e.g. analytical verification), the study is may be used only as supportive information.
307	CA 8.2.1	Druart C. et al.	2017	A full life-cycle bioassay with Cantareus aspersus shows reproductive effects of a glyphosate-based herbicide suggesting potential endocrine disruption.	Environmental pollution (2017), Vol. 226, pp. 240	5.4.1 case b) Relevant but supplementary information: The test design is novel and the achieved endpoints cannot be used in an EU ecotox risk assessment for Annex I renewal.
327	CA 8.2.1	Gaur H. et al.	2019	Glyphosate induces toxicity and modulates calcium and NO signaling in zebrafish embryos.	Biochemical and biophysical research communications (2019 Vol. 513, No. 4, pp. 1070	5.4.1 case b) Relevant but supplementary information: Considered supplementary as the approaches used are not used in Ecotox risk assessment for Annex I renewal.
361	CA 8.2.1	Isaac A. O. et al.	2017	Behavioural and some physiological assessment of glyphosate and paraquat toxicity to juveniles of African catfish, Clarias gariepinus.	Pakistan Journal of Zoology (2017), Vol. 49, No. 1, pp. 183	5.4.1 case b) Relevant but supplementary information: Although the study itself is not directly relatable to an EU level ecotoxicological risk assessment for Annex I renewal purposes, the study was potentially considered as sublethal effects on fish behaviour following exposure to glyphosate were described.
372	CA 8.2.1	Jofre D. M. et al.	2013	Fish Toxicity of Commercial Herbicides Formulated With Glyphosate	Journal of Environmental & Analytical Toxicology. Vol. 4, no. 1, pp. 1	5.4.1 case b) Relevant but supplementary information: Data considered supplemental as the test design and the achieved endpoints are not those used in EU risk assessment. The test substance although not specifically identified, in terms of the SL salt of glyphosate, looks like it could be at a similar a.e. content.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
414	CA 8.2.1	Le Mer C. et al.	2013	Effects of chronic exposures to the herbicides atrazine and glyphosate to larvae of the threespine stickleback (Gasterosteus aculeatus).	Ecotoxicology and environmental safety (2013), Vol. 89, pp. 174	5.4.1 case b) Relevant but supplementary information: The glyphosate analytical concentrations were highly variable, but overall based on the 2008 dataset, the mean measured values were within 25% of the nominal exposure concentrations. The sticklebacks were obtained from the natural environment and therefore prior exposure to chemicals cannot be discounted, although the fish were selected from the same location in two different years and achieved similar assay results in both years. The test system was considered robust based on the performance of the two positive control groups. Concerning the test design, the study was conducted according to methods described in Hahlbeck (2004) 'The juvenile threespined stickleback (Gasterosteus aculeatus L.) as a model organism for endocrine disruption: I. Sexual differentiation' whilst all available information is presented in this paper, the environmental conditions employed during the chronic exposure part of the test are not confirmed and validity criteria are not clearly stated. The achieved measured concentrations were also lower than is required for this study type and analysis in one of the two studies described was not complete. Whether the study was conducted according to GLP cannot be confirmed from the paper. Given some of the uncertainty over elements of the test design, the study should be considered unreliable.
523	CA 8.2.1	Prevot-D'Alvise N. et al.	2013	Acute toxicity of a commercial glyphosate formulation on European sea bass juveniles (Dicentrarchus labrax L.): gene expressions of heme oxygenase-1 (ho-1), acetylcholinesterase (AChE) and aromatases (cyp19a and cyp19b).	Cellular and molecular biology (2013), Vol. 59 Suppl, pp. OL1906	5.4.1 case b) Relevant but supplementary information: Test item was appropriately identified as being linked to the representative formulation. Test design does not however follow a recognised approach, uneven sample sizes and large fish were exposed. The rationale behind test concentration selection was not clear and dose preparation was unclear as exposure rates could not be confirmed. Effects of acetone on fish were not discussed. Endpoints anyway demonstrate low toxicity compared to existing list of endpoints.
529	CA 8.2.1	Rahnama R. et al.	2018	Acute toxicity of herbicides on the survival of adult shrimp, Artemia Franciscana	Iranian Journal of Toxicology (2018), Vol. 12, No. 6, pp. 45	5.4.1 case b) Relevant but supplementary information: Important information is missing in the material and methods section. The preparation and application of the test solutions was not reported. The test item is not adequately specified. The given purity of 41 % indicates that a product was tested. However, it is not clear whether the test concentrations refer to the product or to the active substance. In addition, the biological results of the test were not sufficiently stated. The endpoint data presented in the paper is difficult to understand. Table 3 in the article indicates a 48 hour LC50 of 17.483 mg/L, whilst in Figure 2, the 48 hour LC50 is 38.897 mg/L. Therefore, the reliability of the data presented in the article is questionable. In addition, it is unclear whether the animals were fed during the assay. Figure 3 appears to show artemia with egg bags and highlights the contents of the rudimentary artemia gut as being those

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						exposed to herbicides. This observation is not supported by any information presented in the paper. No mortality data for the test concentrations nor for the controls is presented to evaluate the results. Assessment of the statistical power of the assay is not possible. Furthermore, there was no analytical verification of test concentrations reported, there is no guideline stated and it is non GLP. Multiple doses were tested, but a positive control group was not included, so the performance / robustness of the test system cannot be confirmed. The study is considered unreliable.
549	CA 8.2.1	Sadeghi A. et al.	2014	Investigation of LC50, NOEC and LOEC of glyphosate, deltamethrin and pretilachlor in guppies (Poecilia reticulata)	Iranian Journal of Toxicology (2014), Vol. 8, No. 26, pp. 1124	5.4.1 case b) Relevant but supplementary information: Study was considered to be conducted according to a recognised guideline via the cited reference in the paper, but the test system specifics cannot be confirmed. For example, there are validity criteria stated but water qualities / environmental conditions are not presented, so the suitability of the test system cannot be confirmed. Additionally, there was no analytical verification of the exposure concentrations, so exposure cannot be confirmed. The source and age / size of the fish are not presented in the paper, so the appropriateness of the test system cannot be confirmed. Additionally, the size of the aquariums used is stated (120 L) but the volume of test or control medium in these vessels is not stated, therefore fish loading rates cannot be determined. The test substance is identified as a 'commercial 41% glyphosate' – no other information are presented so effects cannot clearly be related to the active substance glyphosate, and the relevance of the test item used to the EU renewal of MON 52276 cannot be confirmed. The study is considered unreliable.
558	CA 8.2.1	Saska P. et al.	2017	Treating Prey With Glyphosate Does Not Alter the Demographic Parameters and Predation of the Harmonia axyridis (Coleoptera: Coccinellidae).	Journal of economic entomology (2017), Vol. 110, No. 2, pp. 392	5.4.1 case b) Relevant but supplementary information: Exposure was performed via treated prey, which does not correspond to an adequate route of exposure regarding current test guideline for non-target-arthropods. 2 mL test solution was applied to 50 aphids placed on a filter paper in a petri dish, (dimension unknown). There is no analytical verification, and the study does not conform to guidelines nor GLP. The study is well documented, but no endpoints could be derived which can be applied for the risk assessment. Therefore, the study is considered as supplementary only.
614	CA 8.2.1	Uchida M. et al.	2012	Toxicity evaluation of glyphosate agrochemical components using Japanese medaka (Oryzias latipes) and DNA microarray gene expression analysis	The Journal of toxicological sciences (2012), Vol. 37, No. 2, pp. 245	5.4.1 case b) Relevant but supplementary information: The material and methods part lack some important information. Only glyphosate was sufficiently documented, but the formulation Roundup is not specified. In addition, it is unclear whether the test concentrations for the formulation refer to the active ingredient or to the product. The test design is not adequately described. Only a concentration range was given and tested dose rates remain unclear. The performance of a control group as well as the description of observations is not reported. No mortality data neither for the test concentrations nor for

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						the controls was given to evaluate the results. Furthermore, there was no analytical verification of test concentrations reported. No suitable exposure throughout the test was demonstrated and thus the reliability of the study is questionable. The test guideline followed was not stated nor was the study conducted to GLP.
622	CA 8.2.1	Velasques R. R. et al.	2016	Roundup(®) in Zebrafish: Effects on Oxidative Status and Gene Expression.	Zebrafish (2016), Vol. 13, No. 5, pp. 432	5.4.1 case b) Relevant but supplementary information: The data presented demonstrates that in the presence of a toxicant, there are changes in the oxidative status of zebrafish gills and liver tissue. However, these data cannot be related to an Annex I risk assessment for renewal.
654	CA 8.2.1	Yusof S. et al.	2014	Effect of glyphosate-based herbicide on early life stages of Java medaka (Oryzias javanicus): a potential tropical test fish.	Marine pollution bulletin (2014), Vol. 85, No. 2, pp. 49	5.4.1 case b) Relevant but supplementary information: There is insufficient explanation provided on the analytical verification of the test concentrations. The test concentrations were high ranging from 100 to 500 ppm. A regulatory endpoint is not available. There is no verification of dose levels, and the study does not conform to any guidelines nor GLP. The article can be considered as supplementary information only.
663	CA 8.2.1	Zhang S. et al.	2017	Biological impacts of glyphosate on morphology, embryo biomechanics and larval behavior in zebrafish (Danio rerio).	Chemosphere (2017), Vol. 181, pp. 270	5.4.1 case b) Relevant but supplementary information: Provides information on a test species that is relied upon in the risk assessment. But endpoints cannot be related to an EU level ecotox risk assessment.
262	CA 8.2.1, CP 10.2.1	Chandrasekera W. U. et al.	2011	The lethal impacts of Roundup® (glyphosate) on the fingerlings of guppy, Poecilia reticulata Peters, 1859.	Asian Fisheries Science (2011), Vol. 24, No. 4, pp. 367	5.4.1 case b) Relevant but supplementary information: The material and methods lacks important information. The purity of the formulation is not presented. There is a narrative on water qualities / environmental conditions during the test, but there is no actual data presented to confirm the acceptability of the exposure / test conditions except for a value presented for dissolved oxygen levels. There was no analytical verification of test concentrations reported and therefore the level of exposure cannot be confirmed. The study is considered unreliable.
645	CA 8.2.1, CP 10.2.1	Xie RuiTao et al.	2010	The acute toxicity of five pesticides to yellow catfish Pelteobagrus vachelli.	Fisheries Science (2010), Vol. 29, No. 5, pp. 274	5.4.1 case b) Relevant but supplementary information: Acute effects on Yellow Catfish in a static 96 h test. The application method (preparation of test solution etc.) is not specified. The concentrations used is unclear, and appears to be tested in a range between 7 to 20 mg/L No information on the test item whether it was product or active ingredient was provided. Therefore, the biological results can not be used for the risk assessment.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
501	CA 8.2.2	Panetto O. S. et al.	2019	The effects of Roundup® in embryo development and energy metabolism of the zebrafish (Danio rerio)	Comparative biochemistry and physiology (2019), Vol. 222, pp. 74	5.4.1 case b) Relevant but supplementary information: The acute 96 hour-LC50 for zebrafish embryo after exposure to Roundup was determined to be 58.3 mg/L. Seven test concentrations between 3.5 and 350 mg/L were used with 4 replicates and 20 embryos each. It was stated that the test was performed based on OECD guideline 236. This study type has six validity criteria for the control group, including fertilization rate success (required ≥70% in batch tested), hatching rate at 96 hours (required ≥80%) and overall survival (required ≥90%). There is also a validity criteria requirement for the results of a positive control group, using 3, 4-dichloroaniline, to achieve a minimum of 30% mortality at 96 hours. There are also two water quality criteria relating to water temperature (required 26 ±1 ºC at any time during the test) and for dissolved oxygen at 96 hours to be > 80% of the saturation. Whilst dissolved oxygen levels at 6 mg O2/L were achieved in the test, the temperature was outside of the validity criteria limits, being maintained at 28 ±1 ºC for the study duration. Therefore the dissolved oxygen level cannot be confirmed as reporting of dissolved oxygen in terms of mg O2/L requires information on atmospheric pressure and temperature to resolve actual dissolved oxygen in terms of percentage saturation. A slight increase in temperature by a degree Celcius is not overly concerning, however, it is difficult to conclude on the reliability of the study as only one other validity criteria is mentioned, with respect to control survival, with 2% mortality achieved in the controls. There is no information presented on the fertilization rate of the batch of eggs used, nor is there hatching rates presented for the controls or the treatment groups. In addition, the performance of the test system cannot be confirmed as the results of a positive control group were not included. In addition, there are no biological data for the treatment groups presented other than in figures, so the data in the figures cannot be confirmed. Furthermore, claims that the achieved LC50 of 58.3 mg/L is 15,000 times lower than that used in agriculture is not supported by corresponding surface water monitoring data. A final point is that the test concentrations in the test system were not analytically verified and therefore, exposure concentrations cannot be confirmed. The study is considered unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
617	CA 8.2.2, CA 8.2.3, CP 10.2.2, CP 10.2.3	Uren Webster T. M. et al.	2014	Effects of glyphosate and its formulation, roundup, on reproduction in zebrafish (Danio rerio).	Environmental science & technology (2014), Vol. 48, No. 2, pp. 1271	5.4.1 case b) Relevant but supplementary information: The test substance Roundup GC is not the representative formulation for the Annex I renewal. There was only a single glyphosate exposure group at 10 mg/L prepared from analytical grade. The purity of the material was not confirmed, but it was stated to be analytical grade. The study provides no endpoints for glyphosate, that could be used in the ecotoxicology risk assessment for Annex I renewal. Thus the study is conssidered supplementary only.
439	CA 8.2.2.1, CP 10.2.3	Lugowska K.	2018	The effects of Roundup on gametes and early development of common carp (Cyprinus carpio L)	Fish physiology and biochemistry (2018), Vol. 44, No. 4, pp. 1109	5.4.1 case b) Relevant but supplementary information: The material and methods part of the study lack some important information. The preparation of test solutions is missing. The time course of the experiment is unclear. Furthermore, there was no analytical verification of test concentrations reported. Suitable exposure throughout the study was not demonstrated and thus the reliability of the study is questionable. The performance / validity of the test cannot be confirmed as there was no positive control included validity criteria were not stated. No regulatory endpoint useful for risk assessment is given. The study is not to a guideline and is not GLP.
644	CA 8.2.3	Xia S. et al.	2013	Induction of vitellogenin gene expression in medaka exposed to glyphosate and potential molecular mechanism	Zhongguo Huanjing Kexue (2013), Vol. 33, No. 9, pp. 1656	5.4.1 case b) Relevant but supplementary information: The study was not conducted according to GLP and a relevant guideline was not followed. The current EU stepwise endocrine approach is detailed, and the approach conducted within this study does conform to the suggested guidance. Significant limitations in the study include a lack of a standard testing approach or specific validation criteria. The test concentrations were not analytically verified and the critical dose regime provided to the Medaka is lacking. Similarly the source of the fish tested is unknown. No clear dose response relationship or derived endpoint from the study could be determined.
191	CA 8.2.4	Alhewairini S. S.	2017	Toxicity of the herbicide glyphosate to non-target species Caenorhabditis elegans.	Journal of Food, Agriculture & Environment (2017), Vol. 15, No. 2, pp. 97	5.4.1 case b) Relevant but supplementary information: The study has not been conducted according to a recognised test guideline and there are no validity criteria presented. The generated endpoints are not based on direct effects on the nematode, but instead, are based on the optical density related to the density of bacteria present in the NGM ajar test cultures. It is unclear if the presented mortality data were due to direct effects of glyphosate in the cultures, or due to indirect effects associated with reduced feeding activity. There was no test substance information presented and glyphosate concentrations were not measured / confirmed during the study. Finally, there were no quantifiable endpoints presented in the paper, that would be considered applicable to an EU level ecotoxicological risk assessment.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
209	CA 8.2.4	Avigliano L. et al.	2014	Effects of glyphosate on growth rate, metabolic rate and energy reserves of early juvenile crayfish, Cherax quadricarinatus M.	Bulletin of environmental contamination and toxicology (2014), Vol. 92, No. 6, pp. 631	5.4.1 case b) Relevant but supplementary information: Enzymatic endpoints discussed that are not used in EU level assessment. Mortality and survival data not discussed in paper.
273	CA 8.2.4	Cordova Lopez A. M. et al.	2019	Exposure to Roundup® affects behaviour, head regeneration and reproduction of the freshwater planarian Girardia tigrina	Science of the total environment (2019), Vol. 675, pp. 453	5.4.1 case b) Relevant but supplementary information: This is an invasive flatworm species in the EU. No specific test guidelines are available for this type of study, despite the range of endpoints that appear to have been covered.
295	CA 8.2.4	Demetrio P. M. et al.	2012	Effects of pesticide formulations and active ingredients on the coelenterate Hydra attenuata (Pallas, 1766).	Bulletin of environmental contamination and toxicology (2012), Vol. 88, No. 1, pp. 15	5.4.1 case b) Relevant but supplementary information: Endpoints for Hydra attenuata are not a data requirement for the renewal data requirements under 1107/2009.
351	CA 8.2.4	Hansen L. R. et al.	2016	Behavioral responses of juvenile Daphnia magna after exposure to glyphosate and glyphosate-copper complexes.	Aquatic toxicology (2016), Vol. 179, pp. 36	5.4.1 case b) Relevant but supplementary information: Paper considers the influence of metals in daphnia testing and their influence on toxicity. Soils on the toxicity of endpoints considering speciation and enhanced toxicity in the presence of metals are not used in the EU level ecotox risk assessment.
401	CA 8.2.4	Kumar M. S. A. et al.	2013	Toxic impacts of two organophosphorus pesticides on the acetylcholinesterase activity and biochemical composition of freshwater fairy shrimp Streptocephalus dichotomus.	International Journal of Pharma and Bio Sciences (2013), Vol. 4, No. 2, pp. B-966	5.4.1 case b) Relevant but supplementary information: The test does not follow a recognised test guideline. There are no details on the test design used in the exposure part of the test, such as test media preparation and test vessels / replication details, and the water quality / environmental conditions during the exposure period. Nor are there any validity criteria stated, which are necessary to establish the acceptability of the study (eg. shrimp cyst hatching success and the percentage survival in the control group in both toxicity tests). There are no biological data presented to confirm the reported LC50 values. There is no rationale described justifying the duration of exposure. Details on the test substances used in the test are not presented and there is no analytical verification of test concentrations, so exposure levels cannot be verified. The study is considered unreliable.
539	CA 8.2.4	Reno U. et al.	2016	EFECTOS SUBLETALES DE CUATRO FORMULACIONES DE GLIFOSATO SOBRE Daphnia magna Y Ceriodaphnia dubia (CRUST ACEA, CLADOCERA)	Natura Neotropicalis (2016), Vol. 47, No. 1, pp. 7	5.4.1 case b) Relevant but supplementary information: The aim of the study was to compare the chronic toxicity of four different commercially available glyphosate products to Daphnia magna and Ceriodaphnia dubia. The study was not conducted according to GLP and the study design lacks some details compared with relevant guidelines. The test concentrations are based on nominal and no analytical verification of test item concentrations were conducted (only analysis of stock solutions using an unspecific detector). Although the details of the statistical analyses are reported, the study report only describes where significant differences were found. No detailed results including standard deviations of the investigated parameters are provided. As the study is based on different glyphosate products, the toxicity of glyphosate active substance alone is unknown and therefore endpoints generated from this study are not quantifiable and deliver only supplementary information.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
547	CA 8.2.4	Ruiz-Gonzalez E. L. et al.	2018	Assessment of median lethal concentration (CL50) of pollutants on Macrobrachium tenellum juveniles	Latin American Journal of Aquatic Research (2018), Vol. 46, No. 3, pp. 589	5.4.1 case b) Relevant but supplementary information: Considered supplementary as the test substance cannot be explicitly identified. Information presented suggests that this is not the representative formulation for the renewal as it is based on the potassium salt of glyphosate.
647	CA 8.2.4	Xu Y-g. et al.	2015	Joint Toxicity of Glyphosate and As(III)to Daphnia magna in Aquatic Environment	Journal of Agro-Environment Science (2015), Vol. 34, No. 11, pp. 2076	5.4.1 case b) Relevant but supplementary information: This study concentrates on models used to estimate the individual and mixture toxicity of glyphosate and As (III) to Daphnia magna. LC50 values were compared with measured data. The study was not conducted according to GLP, however the acute toxicity studies were conducted to a relevant ISO guideline. Preparation and dose verification were not performed therefore the endpoint is questionable. The study is considered unreliable.
292	CA 8.2.4, CP 10.2.2	Deepananda K. H. M. A. et al.	2011	Acute toxicity of a glyphosate herbicide, Roundup (R), to two freshwater crustaceans.	Journal of the National Science Foundation of Sri Lanka (2011), Vol. 39, No. 2, pp. 169	5.4.1 case b) Relevant but supplementary information: After exposure to Roundup® the 48 hour acute LC50 for adult copepod Phyllodiaptomus annae was determined to be 1.059 mg/L. This endpoint is questionable as there was only 19% mortality at the highest exposure concentration in the test (1.6 mg/L). For the second species, the 72 and 96 hour LC50 for decapod shrimp Caridina nilotica was determined to be 107.53 and 60.97 mg/L, respectively. However, the mean percenatge mortality at both timepoints was identical from Table 1 in the paper. As there are no biological data presented in the paper, the observed mortality and the LC50 calculation cannot be confirmed. The formulation content is identified as Roundup® (360g/L, 98%). However, the presented purity appears to be incorrectly stated, as a formulation with 98% purity, would suggest a technical material has been used, so there is uncertainty in actually what has been tested in the study. The tests were conducted according to EPA Guideline "Methods of Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms". However, the origin of the organisms is not given. Therefore, previous exposure the test species may have had to pesticides or other chemicals is unclear. Furthermore, there was no analytical verification of test concentrations reported and the study is non-GLP, thus the reliability of the endpoint is questionable. Given the uncertainty in what was actually tested, the calculated endpoints and the conduct of the test, the study is considered unreliable.
571	CA 8.2.4.1, CA 8.6, CA 8.7	Sihtmaee M. et al.	2013	Ecotoxicological effects of different glyphosate formulations	Applied soil ecology (2013), Vol. 72, pp. 215	5.4.1 case b) Relevant but supplementary information: The study design and overall conduct were well described. The D. magna toxicity test was performed according to OECD guideline 202 but validity criteria were not mentioned. Analytical verification of the test materials and exposure concentrations within the study was also lacking. Overall, the study is considered to be of limited relevance to the EU annex renewal of glyphosate as the D. magna toxicity test

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						was only a small part of the study, and the soil portion of the study was conducted using exaggerated soil concentrations (up to 1000 times relevant levels). For these reasons, the study is considered supplemental only.
229	CA 8.2.4.1, CP 10.2.1	Boonsoong B. et al.	2012	Acute toxicity of Roundup and carbosulfan to the Thai fairy shrimp, Branchinella thailandensis.	Communications in agricultural and applied biological sciences (2012), Vol. 77, No. 4, pp. 431	5.4.1 case b) Relevant but supplementary information: The study was not conducted according to a recognised test guideline and no validity criteria are presented for control group performance, so the robustness of the assay can not be concluded. In the materials and methods, there is insufficient information presented on the test medium preparation approach and on the environmental conditions used in the test. There was no chemical analysis and therefore exposure cannot be confirmed. There are insufficient explanations provided on the experimental design, particularly environmental condition and conduct during the test. The study is considered unreliable.
296	CA 8.2.4.1, CP 10.2.1	Demetrio P. M. et al.	2014	The effect of cypermethrin, chlorpyrifos, and glyphosate active ingredients and formulations on Daphnia magna (Straus).	Bulletin of environmental contamination and toxicology (2014), Vol. 93, No. 3, pp. 268	5.4.1 case b) Relevant but supplementary information: The test was not performed according to a relevant guideline. Although procedures are well documented, the water qualities during testing are not reported (only stock culture holding conditions are reported) and the test design in the study is not described, such as the number of animals exposed, test media preparation details and acclimation period prior to exposure. There are no biological data presented in order to confirm the achieved endpoints. The glyphosate formulation used in the testing is not the representative formulation for the renewal. Apparent from the endpoints achieved for the technical material and for the formulation, is the increased sensitivity of daphnia to the formulation, which is considered attributable to the co-formulants in the formulation and not to glyphosate. Based on the uncertainty associated with the materials and methods as described above, the study is considered as supplementary only.
436	CA 8.2.4.2, CA 8.2.5.2	Liu Xiao-wei et al.	2012	Toxicological effect of paraquat and glyphosate on cladoceran Moina macrocopa.	Shengtaixue Zazhi (2012), Vol. 31, No. 8, pp. 1984	5.4.1 case b) Relevant but supplementary information: The conclusions are unclear based on several factors including the impact of the density of the algal food source and the temperature of the test media. This study is not adequately described – for example, water quality / environmental conditions cannot be confirmed from the paper, there were no validity criteria stated and no analytical verification of exposure concentrations was undertaken. Given the uncertainty over the test design and the procedures undertaken and the fact that the study was not conducted according to a recognised test guideline relevant for the EU risk assessment, the test is considered as unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
278	CA 8.2.6	Dabney B. L. et al.	2018	Low-dose stimulation of growth of the harmful alga, Prymnesium parvum, by glyphosate and glyphosate-based herbicides.	Harmful algae (2018), Vol. 80, pp. 130	5.4.1 case b) Relevant but supplementary information: This paper does not present endpoints that can be used in the ecotox risk assessment for the renewal. The information are however considered supportive to discussions over hormesis.
362	CA 8.2.6	Issa A. A. E. et al.	2013	Alterations in some metabolic activities of Scenedesmus quadricauda and Merismopedia glauca in response to glyphosate herbicide.	Journal of Biology and Earth Sciences (2013), Vol. 3, No. 1, pp. B17	5.4.1 case b) Relevant but supplementary information: The reported endpoints in terms of growth rates and pigment levels are not relateable to the EU level risk assessment for the renewal. The idenitity of the test items cannot be confirmed.
407	CA 8.2.6	Lam C. H. et al.	2020	Toxicity of herbicides to cyanobacteria and phytoplankton species of the San Francisco Estuary and Sacramento-San Joaquin River Delta, California, USA.	Journal of environmental science and health. Part A, Toxic/hazardous substances & environmental engineering (2020), Vol. 5, pp. 107	5.4.1 case b) Relevant but supplementary information: As the composition of the Roundup used in the test cannot be confirmed, the study must be considered as being supplementary. Roundup Custom is for aquatic uses so would not contain surfactants. It is not clear from the study if the product was tested with an approved surrfactant added or not as would be detailed on the label. There is limited information in the paper on the label. Roundup Custom is not the representative formulation for the renewal and aquatic uses are not on the current GAP table.
285	CA 8.2.7	de Campos Oliveira R. et al.	2016	Assessment of the potential toxicity of glyphosate-based herbicides on the photosynthesis of Nitella microcarpa var. wrightii (Charophyceae)	Phycologia (2016), Vol. 55, no. 5, pp. 577	5.4.1 case b) Relevant but supplementary information: Despite the study using a recognised OECD guideline, the endpoints in terms of respiration rates are not relevant to an EU level risk assessment for Annex I renewal, which specifically considers inhibition of glyphosate growth rates. The study considers technical glyphosate, Roundup and AMPA. Despite the techical material being identified, the formulation was not. It is not possible to conclude on the effects caused by the formulation as it was inferred that the product contains POEA.
288	CA 8.2.7	de Jesus Veloso Castro A. et al.	2015	Using a toxicity test with Ruppia maritima (Linnaeus) to assess the effects of Roundup.	Marine pollution bulletin (2015), Vol. 91, No. 2, pp. 506	5.4.1 case b) Relevant but supplementary information: This paper presents information on the effects of glyphosate on a saline tolerant species. However, there is no glyphosate exposure presented in the paper so it is very difficult to relate the observed effects to an exposure event / agricultural application.
511	CA 8.2.7	Pereira P. C. et al.	2019	Acute Toxicity of Herbicides and Sensibility of Aquatic Plant Wolffia brasiliensis as a Bioindicator Organism	Planta Daninha (2019), Vol. 37, pp. e019201636	5.4.1 case b) Relevant but supplementary information: This paper describes a non-standard aquatic plant ecotoxicity test for a non-EU native species, and is therefore difficult to relate to an EU level ecotox risk assessment. The formulation used is specific to aquatic applications that are not on the proposed GAP for the renewal.
548	CA 8.2.7	Rzymski P. et al.	2013	The effect of glyphosate-based herbicide on aquatic organisms - a case study.	Limnological Review (2013), Vol. 13, No. 4, pp. 215	5.4.1 case b) Relevant but supplementary information: Information may be relevant to the wider discussion on trophic interactions, but cannot be related to the EU level ecotox risk assessment for the renewal.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
180	CA 8.2.8	Abdulkareem S. I. et al.	2015	Histopathological effects of lethal and sub-lethal concentrations of glyphosate on gills and liver of African catfish, Clarias gariepinus.	Journal of Aquatic Sciences (2015), Vol. 30, No. 1, pp. 53	5.4.1 case b) Relevant but supplementary information: Although blood, gill and liver enzyme levels are not relatable to an EU level ecotoxicological risk assessment for Annex I renewal purposes, the study was considering acute effects and chronic sublethal effects on fish following exposure to glyphosate. The study has not been conducted according to a recognised test guideline and there are no validity criteria presented. The environmental holding conditions (water quality) for the fish prior to and during the study were not included. The fish loading rate (g/fish L) was 20.5 g fish/L, which far exceeds the loading rate required for chronic static renewal fish tests. The typical loading rates for studies submitted to support regulatory submission for Annex I renewals in the EU are 0.8 to 1.0 g fish/L. The impact of such high fish densities cannot be established, as no water quality measurements were included in ther paper, such as the dissolved oxygen levels (mgO2/L) and pH values. There was no test substance information presented, glyphosate concentrations were not measured / confirmed during the 28 day study duration. Behavioural observations in test vessels could not be related to the nominal exposure concentration. Finally, there were no quantifiable endpoints presented in the paper, considered applicable to an EU level ecotoxicological risk assessment for renewal purposes.
181	CA 8.2.8	Abdulkareem S. I. et al.	2013	Effects of sub-lethal concentrations of glyphosate on behaviour and some biochemical parameters of African catfish (Clarias gariepinus)	Proceedings of the 28th annual conference of the Fisheries Society of Nigeria (2013), pp. 188	5.4.1 case b) Relevant but supplementary information: Although blood, gill and liver enzyme levels are not relatable to an EU level ecotoxicological risk assessment the renewal purposes, the study was considered as supplemental due to the sublethal effects on fish behaviour following exposure to glyphosate. The study has not been conducted according to a recognised test guideline and there are no validity criteria presented. The fish species and their origin are not described and environmental conditions (water quality) for the fish prior to and during the study have not been included. The fish loading rate (g/fish L test medium) was 20.5 g fish/L, which far exceeds the loading rate required for chronic static renewal fish tests typically required for studies submitted to support regulatory submission for renewals in the EU (0.8 to 1.0 g fish/L). The impact of such high fish densities cannot be established, as no water quality measurements were provided such as levels of dissolved oxygen (mgO2/L) and pH. Similarly, there was no test substance information or rationale presented for the selection of exposure concentrations. glyphosate concentrations were also not measured / confirmed during the 28 day study duration. Behavioural observations relating to the swimming activity are not relatable to the nominal exposure concentration. Finally, there are no applicable EU level ecotoxicological risk assessment quantifiable endpoints presented in the paper.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
186	CA 8.2.8	Agbon A. O. I. et al.	2014	The potential impact of Glyphosate on captured fisheries productivity and sustainability	Proceedings of the 29th annual conference of the Fisheries Society of Nigeria (2014), pp. 17	5.4.1 case b) Relevant but supplementary information: The study was not conducted according to a recognised acute test guideline and there are no validity criteria presented. The overall study duration was 35 days, from which a 96 hr LC50 value was determined. There are no data presented in the paper in terms of mortalities over the first 4 days from which a 96 hr LC50 could be determined. The fish also appear to have been fed for the 35 day duration, which is not in accordance with the recognised acute fish toxicity test guideline used according to the EU No. 283 2013 data requirements. The environmental holding conditions (water quality) for the fish prior to and during the study were not included. The fish loading rate (g/fish L) cannot be determined as no test vessel water volumes are presented. There are no water quality measurements included in ther paper, such as the dissolved oxygen levels (mgO2/L) and pH values. There was no test substance information presented, glyphosate concentrations were not measured / confirmed during the 35 day study duration. No sub-lethal behavioural observations were included in the paper. Finally, the presented endpoints cannot be confirmed from the presented information in the paper. The study is considered unreliable.
468	CA 8.2.8	Mohamed I. A-w. et al.	2016	Unique efficacy of certain novel herbicides against Culex pipiens (Diptera: Culicidae) mosquito under laboratory conditions	Advances in Environmental Biology (2016), Vol. 10, No. 8, pp. 104	5.4.1 case b) Relevant but supplementary information: Important information is missing in the material and methods section. The preparation and application of the test solutions as well as the tested concentration range were not reported. The test items were not adequately specified. It is not clear whether the test concentrations refer to the product or to the active substance. Moreover one active ingredient is given as glyphosate isopropylamine which should be formulated as a salt resulting in test concentrations as acid equivalents. In addition, the biological results of the test were not sufficiently stated. No mortality data for the test concentrations nor for the controls was given to evaluate the results. Furthermore, there was no analytical verification of test concentrations reported. The study is not to a guideline and is not GLP. The study is considered unreliable.
472	CA 8.2.8	Mottier A. et al.	2013	Effects of glyphosate-based herbicides on embryo-larval development and metamorphosis in the Pacific oyster, Crassostrea gigas.	Aquatic toxicology (2013), Vol. 128-129, pp. 67	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP and/or according to a recognized test guideline and there are no validity criteria presented. The authors state that the EC50 values computed for the embryotoxicity tests with glyphosate and AMPA were lower than the values reported for regulatory model organisms. The embryotoxicity test appeared more sensitive but also a little more difficult to assess compared to the metamorphosis assay. Given the limitations cited, the study is considered unreliable.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
502	CA 8.2.8, CP 10.2.1	Panwen M. et al.	2013	Acute toxicity of pesticides glyphosate and paraquat on river snails	Siliao Yanjiu (2013) No. 11, pp. 44	5.4.1 case b) Relevant but supplementary information: The material and methods sections lack important information. The test organisms were not specified. Detailed information on preparation and application of test solution is missing. The tested concentrations and the exposure time were not reported in the material and methods. The test item is not specified. It is only stated that it contains 10 % active ingredient, but other ingredients are unknown. No control results are available. Furthermore, it is unclear whether the reported endpoints refer to the active substance or to the product. No analytical verification of test concentrations were performed. The study is considered unreliable.
646	CA 8.2.8, CP 10.2.3	Xu Y. et al.	2010	Acute Toxicity of Ten Pesticides to Larval Red Swamp Crayfish Procambarus Clarkii.	Asian Journal of Ecotoxicology (2010), Vol. 5, No. 1, pp. 50.	5.4.1 case b) Relevant but supplementary information: Effects on red swamp crayfish. Test species raised in and collected from a rice field in Shanghai. It is not clear what exposure the test species may have had to pesticides or other chemicals previously. It is not clear if the glyphopsate is technical or product. No biological results (e.g. mortalities) for the control or any test concentration reported. The study is considered unreliable.
214	CA 8.3	Baglan H. et al.	2018	Glyphosate impairs learning in Aedes aegypti mosquito larvae at field-realistic doses.	The Journal of experimental biology (2018), Vol. 221, No. 20, pp 1	5.4.1 case b) Relevant but supplementary information: Information presented on the learning behaviour of mosquito larvae exposed to glyphosate. These data are difficult to relate to an EU level ecotox risk assessment for the renewal.
218	CA 8.3	Bara J. J. et al.	2014	Sublethal effects of atrazine and glyphosate on life history traits of Aedes aegypti and Aedes albopictus (Diptera: Culicidae).	Parasitology research (2014), Vol. 113, No. 8, pp. 2879	5.4.1 case b) Relevant but supplementary information: The test provides information on the impact of glyphosate on mosquito development, but the test design employed is not a recognised approach used for Annex I data generation for renewal purposes. Test item purity not stated, only pestanol grade. No chemical analysis.
256	CA 8.3	Castilhos R. V. et al.	2014	Selectivity of pesticides used in peach orchards on eggs and pupae of the predator Chrysoperla externa. Seletividade de agrotoxicos utilizados em pessegueiro sobre ovos e pupas do predador Chrysoperla externa.	Ciencia Rural (2014), Vol. 44, No. 11, pp. 1921	5.4.1 case b) Relevant but supplementary information: The glyphosate product was concluded to be harmless to Chrysoperla and Chrysoperla eggs and pupae. The study was not conducted according to GLP and the study design lacks some details compared with relevant guidelines. The test concentrations are based on nominal values and no analytical verification of test item concentrations was conducted. Although the test design is described in quite some detail, some important information is missing, i.e. regarding the source and content of the applied products, the application of test item and control data are not shown for all parameters. Additionally, according to IOBC/WPRC larval stages should be exposed. As the study is based on a glyphosate product, the toxicity of glyphosate active substance alone is unknown and therefore endpoints generated from this study are not quantifiable and deliver only supplementary information.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
417	CA 8.3	Leccia F. et al.	2016	Disruption of the chemical communication of the European agrobiont groundaX80X90dwelling spider Pardosa agrestis by pesticides	Journal of applied entomology (2016), Vol. 140, No. 8, pp. 609	5.4.1 case b) Relevant but supplementary information: Endpoints based on the impact of chemicals on spider pheromones are not used/required in EU level ecotoxicological risk assessments.
509	CA 8.3	Pasini R. A. et al.	2018	Comparative selectivity of herbicides used in wheat crop on the predators Chrysoperla externa and Eriopis connexa	Planta Daninha (2018), Vol. 36,pp. E018179968	5.4.1 case b) Relevant but supplementary information: In the material and methods section important information is missing. The test items were not adequately specified regarding the content of the active ingredient. It is unclear whether the given active ingredient concentration in the spray solution corresponds to the content of the active ingredient in the formulation. The test did not follow a specific test guideline, although the culturing of the insects was conducted according to recognised approaches. There were no validity criteria established and the performance of the assays was not assessed using a positive control substance. An endpoint that could be used in an ecotoxicology risk assessment was not established.
559	CA 8.3	Saska P. et al.	2016	Treatment by glyphosate-based herbicide alters life history parameters of the rose-grain aphid Metopolophium dirhodum.	Scientific reports (2016), Vol. 6, pp. 27801	5.4.1 case b) Relevant but supplementary information: The paper does not present endpoints that could be used in an EU level ecotox risk assessment.
589	CA 8.3	Stecca C. S. et al.	2016	Side-Effects of Glyphosate to the Parasitoid Telenomus remus Nixon (Hymenoptera: Platygastridae).	Neotropical entomology (2016), Vol. 45, No. 2, pp. 192	5.4.1 case b) Relevant but supplementary information: The study was conducted in accordance with the protocols proposed by IOBC. Exposure via overspray on egg-cards and parasitoid pupae does not correspond to an adequate route of exposure according to current guidelines for testing non-target arthopods. The test design for the bioassay where adults are exposed to dry residues moderately described. The mortality of parasitoids during exposure is unclear, however, the spray deposit is given. The assessment of the biological endpoints in not precisely reported; day of emergence of parasitoids is not given. As the biological data do not report results in values useful for the risk assessment, there is no analytical verification, and the study is non GLP, the study can be considered as supplementary only.
596	CA 8.3	Tahir H. M. et al.	2019	Effect of Pesticides on Biological Control Potential of Neoscona theisi (Araneae: Araneidae)	JOURNAL OF INSECT SCIENCE (2019), Vol. 19, No. 2, pp. 1	5.4.1 case b) Relevant but supplementary information: Considered supplemental as the approach used does not follow an approach recognised at EU level for use in risk assessment.
316	CA 8.3.1	Fagundez G. A. et al.	2016	Do agrochemicals used during soybean flowering affect the visits of Apis mellifera L.?	Spanish Journal of Agricultural Research (2016), Vol. 14, No. 1, p. e0301	5.4.1 case b) Relevant but supplementary information: Field level investigation where soybean are sprayed with glyphosate and the behaviour of bees is assessed. Findings not directly relateable to EU level risk assessment, as OTT crop application not on GAP - the observed effects are potentially useful for the discussion on indirect effects .

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
430	CA 8.3.1	Liao L-H. et al.	2017	Behavioral responses of honey bees (Apis mellifera) to natural and synthetic xenobiotics in food.	Scientific reports (2017), Vol. 7, No. 1, pp. 15924	5.4.1 case b) Relevant but supplementary information: Presented data based on preference behaviour of honey bees cannot be directly related to an EU level ecotoxicological risk assessment - may possibly be used to support a lack of effects despite evidence being based upon preference.
609	CA 8.3.1	Tome H. V. V. et al.	2020	Frequently encountered pesticides can cause multiple disorders in developing worker honey bees.	Environmental pollution (2020), Vol. 256, pp. 113420	5.4.1 case b) Relevant but supplementary information: The data presented are relevant to the wider discussion of the effects of glyphosate on pollinators, but as the rates established for glyphosate used in the study were based on reported levels found in pollen and wax from another active substance, from an exposure perspective, they cannot be related to glyphosate.
620	CA 8.3.1	Vazquez D. E. et al.	2018	Glyphosate affects the larval development of honey bees depending on the susceptibility of colonies	PLoS One (2018), Vol. 13, No. 10, pp. E0205074	5.4.1 case b) Relevant but supplementary information: Endpoints presented are considered supplemental as the method of exposure used for the bees were not described.
279	CA 8.3.1, CP 10.3.1	Dai P. et al.	2018	The Herbicide Glyphosate Negatively Affects Midgut Bacterial Communities and Survival of Honey Bee during Larvae Reared in Vitro.	Journal of agricultural and food chemistry (2018), Vol. 66, No. 29, pp. 7786	5.4.1 case b) Relevant but supplementary information: The bacterial communities in the mid-gut of bees were characterised. No gut bacterial analysis was conducted on the positive control bees. Overall an increase in abundance and richness of bacterial taxa was observed at the highest exposure concentration. The implications of this was not discussed in the paper. Bacterial assemblages in the gut of honey bees is not relatable to an EU level ecotoxicology risk assessment. The study is adequately described including specifications of the test item and test design. However, no regulatory endpoints were derived and there is no analytical verification of dose solutions.
216	CA 8.3.1.4, CP 10.3.1.4	Balbuena M. S. et al.	2015	Effects of sublethal doses of glyphosate on honeybee navigation.	The Journal of experimental biology (2015), Vol. 218, No. 17, pp. 2799	5.4.1 case b) Relevant but supplementary information: Due to the foraging nature of bees in the natural environment described in this study, the effects cannot be solely attributed to glyphosate active substance. However, the impact of bees from other substances foraging during the homing flight is considered negligible as they were exposed to the test substance for 1 hour prior to release. It is a possibility and the data generated using this new experimental design, should be considered with a degree of caution. Furthermore, there is no clear indication of the dose of glyphosate that the bees were exposed to as there was no analytical verification conducted in the study. This is a new experimental design and does not provide relevant endpoints for the regulatory risk assessment of glyphosate Annex I renewal purposes. As there is no test guideline to which this study can be compared and as there is no data requirement nor approach to evaluate the findings of such a study at the regulatory level, the findings of this study should be considered with a degree of caution. The reliability assessment highlights that elements of the study may be considered reliable, but as there are no validity criteria against which this study can be assessed, nor data requirements relating to the achieved endpoints for Annex I renewal of plant

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						protection products, the study must be considered non relevant for EU Annex I renewal purposes from an ecotoxicology risk assessment perspective.
257	CA 8.3.2, CP 10.3.2	Castilhos R. V. et al.	2011	Selectivity of pesticides used in peach orchard on adults of Chrysoperla externa (Hagen, 1861) (Neuroptera: Chrysopidae). Original title: Seletividade de agrotoxicos utilizados em pomares de pessego a adultos do predador Chrysoperla externa (Hagen, 1861) (Neuroptera: Chrysopidae).	Revista Brasileira de Fruticultura (2011), Vol. 33, No. 1, pp. 73	5.4.1 case b) Relevant but supplementary information: Roundup (and many other pesticides) were used as the test substance. Only mortality of lacewing were assessed. Likewise no reproduction endpoints were evaluated and thus no data is relevant to the risk assessment.
438	CA 8.3.2, CP 10.3.2	Lu Li-li et al.	2010	Effects of glyphosate on the growth and development of Agasicles hygrophila	Huanan Nongye Daxue Xuebao (2010), Vol. 31, pp. 22	5.4.1 case b) Relevant but supplementary information: The test substance is 41% glyphosate IPA salt. The study on Agasicles hygrophila was not conducted or based on a relevant NTA guideline.
531	CA 8.3.2, CP 10.3.2	Rainio M. J. et al.	2019	Effects of a glyphosate-based herbicide on survival and oxidative status of a non-target herbivore, the Colorado potato beetle (Leptinotarsa decemlineata)	Comparative biochemistry and physiology. Toxicology & pharmacology (2019), Vol. 215, pp. 47	5.4.1 case b) Relevant but supplementary information: The material and methods section lacks some important information. Newly hatched larvae from field collected beetles were used, however information on previous exposure to other chemicals or field history was not documented. Information on replicates, loading per replicate and test conditions were not reported. The preparation of the test solution was not specified. The test approach used does not follow a recognised test guideline and the rationale for the route of exposure and the dosing volumes used, is not described. The author indicates that a 100% Roundup Bio exposure in nature is unlikely to occur and that the high concentration mainly tests the physiological limits of the system including the antioxidant enzyme capacity of the beetles against the product. Exposure levels where significant effects were observed are unrealistic highlighting. There was no analytical verification, and the study was not performed according to GLP. Furthermore, endpoints based on biochemical analyses of larval homogenates cannot be applied in regulatory risk ecotoxicology assessment of non-target arthropods. Given the unrealistically high exposure levels used in the study, the non-guideline approach and the uncertainties as identified above, the study is considered as supplementary only.
651	CA 8.3.2, CP 10.3.2	You W-y. et al.	2010	Toxicity Evaluation of Sixteen Herbicides to Bombyx mori.	Asian Journal of Ecotoxicology (2010), Vol. 5, No. 1, pp. 91	5.4.1 case b) Relevant but supplementary information: Effects on silkworm via exposure of treated leaves. However, the application method is not specified. The amount of test solution per leaf, the consumed diet per silkworm and the number of organisms per replicate is unclear. Also no control results are available. Therefore the biological results can not be used for risk assessment.

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662	CA 8.3.2, CP 10.3.2	Zhang Q. et al.	2011	An evaluation on acute toxicity of 29 pesticides to Bombyx mori	Canye Kexue (2011), Vol. 37, No. 2, pp. 343	5.4.1 case b) Relevant but supplementary information: Effects of glyphosate (95% TC) on silkworms by using the leaf dipping method: 5 g mulberry leaves were evenly immersed in 10 mL test solution for 10s. However, no useful concentration can be derived. No control results available.
556	CA 8.4, CP 10.4.2.2	Santos M. J. G. et al.	2012	Pesticide application to agricultural fields: effects on the reproduction and avoidance behaviour of Folsomia candida and Eisenia andrei.	Ecotoxicology (2012), Vol. 21, No. 8, pp. 2113	5.4.1 case b) Relevant but supplementary information: The study is well described and performed according to ISO guidelines. Validity criteria were met, where relevant. Glyphosate did not seem to affect either earthworms or collembolans at the recommended field dose; therefore there were no endpoints presented in the paper, thus the study is considered supplementary only.
305	CA 8.4.1	Dominguez A. et al.	2016	Toxicity of AMPA to the earthworm Eisenia andrei Bouche, 1972 in tropical artificial soil.	Scientific reports (2016), Vol. 6, pp. 19731	5.4.1 case b) Relevant but supplementary information: The study is well-documented and performed according to ISO guideline 11268-1 and 11268-2. However, the artificial soil used is not classed as representative in the EU. Soil characteristics are only partly given as information on CEC, organic carbon content and bulk density are missing. Additionally, one of the validity criteria for the chronic test was not met (the reported minimum number of control juveniles is too low). Endpoints (NOEC, LC50) were not derived and therefore this study delivers only supplementary information.
345	CA 8.4.1	Hackenberger Davorka K. et al.	2018	Acute and subchronic effects of three herbicides on biomarkers and reproduction in earthworm Dendrobaena veneta.	Chemosphere (2018), Vol. 208, pp. 722	5.4.1 case b) Relevant but supplementary information: The chronic test was performed according to OECD 222. However, the study was not conducted to GLP. Information on validity criteria are missing, and there is not analytical verification of soil concentrations. The unexpectedly high number of cocoons and the low number of juveniles being produced in the control group at the end of the study suggests that the quality of the earthworms going into the study may have been low. According to OECD 222, by the end of the test, the number of juveniles produced per adult worm should be > 30. In this case, with six adult worms per replicate there was a mean production (juveniles per worm) of 2.67 worms per adult. It is also understood that the OECD 222 test guideline uses a different species (Eisenia fetida) and not Dendrobaena veneta. It is relevant to consider juvenile production in the control as a check on the test system robustness. This cannot be confirmed in this case. Therefore, the study can be considered acceptable as supplementary information.
367	CA 8.4.1	Jarmul-Pietraszczyk J. et al.	2012	Herbicide toxicity to the California earthworms Eisenia fetida Sav. and Dendrobaena veneta Rosa	Ecological Chemistry and Engineering A (2012), Vol. 19, No. 9, pp. 1133	5.4.1 case b) Relevant but supplementary information: This study compared the toxicity of three different commercially available formulations on the reproduction of earthworms, among them a glyphosate containing product (Glifocyd 360 SL). Further detail on active substance content, source and storage conditions were not provided. The study was not conducted according to a recognized test guideline nor under GLP. The origin of the earthworm species and their environmental holding conditions prior to and during the

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						study have not been included. Information on the test soil characteristics is also missing and application of the test item to the soil is not described in detail. Sublethal and reproductive parameters of the control were reported, but information about control mortality is missing. In the chronic test only one single test item concentration was tested, with this information for the acute study missing. The endpoint generated from this study is given in mg/L and it is not clear how it can be transferred to soil concentrations as the bulk density in the test system is unknown and the statistical analysis is not provided in detail. Therefore, the endpoint presented is considered unreliable.
520	CA 8.4.1	Pochron S. et al.	2020	Glyphosate but not Roundup® harms earthworms (Eisenia fetida).	Chemosphere (2020), Vol. 241, pp. 125017	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP. The test design does not correspond to a current test guideline for earthworms focusing on reproduction parameters and there is no endpoint for risk assessment. Only a single dose level was used in the test, which is equivalent to 19.7 kg/ha; substantially higher than the maximum proposed application rate of glyphosate for the renewal. There was no analytical confirmation of levels tested, so exposure cannot be confirmed.
555	CA 8.4.1	Santadino M. et al.	2014	Glyphosate Sublethal Effects on the Population Dynamics of the Earthworm Eisenia fetida (Savigny, 1826)	Water, air, and soil pollution (2014), Vol. 225, No. 12, pp. 2207	5.4.1 case b) Relevant but supplementary information: The chronic laboratory study with E. fetida was not performed according to a recommended guideline and thus, no validity criteria were given. Insufficient information is provided on the experimental design, as no information on the soil characteristics and the application of the test item is given. Only two test item treatment rates, without giving any rationale for choosing the higher dose, and a negative control were tested, but no positive control. No information on underlying raw data is given, i.e. number of control mortality, number of juveniles and cocoons etc. Finally, there are no quantifiable endpoints presented in the paper, considered applicable to an EU level ecotoxicological risk assessment for renewal purposes.
590	CA 8.4.1	Stellin F. et al.	2017	Effects of different concentrations of glyphosate (Roundup 360A®) on earthworms (Octodrilus complanatus, Lumbricus terrestris and Aporrectodea caliginosa) in vineyards in the North-East of Italy	Applied soil ecology (2018), Vol. 123, pp 802	5.4.1 case b) Relevant but supplementary information: The study has not been conducted according to a recognized test guideline and there are no validity criteria presented. There is no information on the choice of test duration and the experimental design is not sufficiently described. A formulation was tested, but no information is given on the set-up of the spray solution, how application was carried out and at which volume. For the soil sampling, the time point of sampling is not stated and no information on storage conditions of the soil prior to use in the study is given. Additionally, information on the soil depth in the experimental test containers is not mentioned. Similarly no information on food and environmental conditions during the exposure period (e.g. temperature, soil

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						moisture, light conditions) are available. Finally, there are no quantifiable endpoints presented in the paper.
274	CA 8.4.2	Correia F. V. et al.	2010	Effects of glyphosate and 2,4-D on earthworms (Eisenia foetida) in laboratory tests.	Bulletin of environmental contamination and toxicology (2010), Vol. 85, No. 3, pp. 264	5.4.1 case b) Relevant but supplementary information: Study looks at the impact of glyphosate on earthworm reproduction. Conducted to relevant guidelines. Technical glyphosate used, Brazilian soils used. Test concentrations from 1 to 1000 mg/kg in a 56 day study. Data is useful but there is no reliable endpoint to be used in the regulatory risk assessment of glyphosate renewal.
308	CA 8.4.2	Druart C. et al.	2010	Towards the development of an embryotoxicity bioassay with terrestrial snails: screening approach for cadmium and pesticides.	Journal of hazardous materials (2010), Vol. 184, No. 1-3, pp. 26	5.4.1 case b) Relevant but supplementary information: Glyphosate a.i., glyphosate products and other products used to compare toxicity to land snails. LC50 generated. But new method descibed not to any established guideline.
325	CA 8.4.2	Garcia-Torres T. et al.	2014	Exposure assessment to glyphosate of two species of annelids.	Bulletin of environmental contamination and toxicology (2014), Vol. 93, No. 2, pp. 209	5.4.1 case b) Relevant but supplementary information: Information may be used to support the lack of effects in earthworm studies.
481	CA 8.4.2	Nevius B. A. et al.	2012	Surface-functionalization effects on uptake of fluorescent polystyrene nanoparticles by model biofilms.	Ecotoxicology (2012), Vol. 21, No. 8, pp. 2205	5.4.1 case b) Relevant but supplementary information: This paper discusses the results of an earthworm avoidance study which is not an endpoint type used in EU level risk assessment for Annex I renewal. Therefore it is considered to be supplementary. No effects were observed for glyphosate exposure.
544	CA 8.4.2	Rose M. T. et al.	2018	Minor effects of herbicides on microbial activity in agricultural soils are detected by N-transformation but not enzyme activity assays	European journal of soil biology (2018), Vol. 87, pp. 72	5.4.1 case b) Relevant but supplementary information: Non-EU soil but relevant endpoints demonstarting a lack of effects on soil microbial populations (n-trans) at field application rates.
615	CA 8.4.2	Ulu T. C. et al.	2016	Effects of different pesticides on virulence and mortality of some entomopathogenic nematodes.	ISJ-Invertebrate Survival Journal (2016), Vol. 13, pp. 111	5.4.1 case b) Relevant but supplementary information: Nematode mortality and effects on virulence are not endpoints used in EU level ecotox risk assessment for the renewal.
230	CA 8.5	Bortoli P. V. et al.	2012	Effects of glyphosate on microbial community structure and activity in two soils under olive plantations. Original Title: Efectos del herbicida glifosato sobre la estructura y el funcionamiento de comunidades microbianas de dos suelos de plantaciones de olivo.	Ecologia Austral (2012), Vol. 22, No. 1, pp. 33	5.4.1 case b) Relevant but supplementary information: Paper presents information on the effects of glyphosate on respiration but the approaches used do not result in endpoints that can be used in an EU level risk assessment as they are based on Argentinian soils.
479	CA 8.5	Nathan V. K. et al.	2020	Pesticide application inhibit the microbial carbonic anhydrase-mediated carbon sequestration in a soil microcosm.	Environmental science and pollution research international (2020), Vol. 27, pp. 4468	5.4.1 case b) Relevant but supplementary information: Endpoints presented are not relevant to the direct effects assessment required for Annex I renewal. However, it does inform in other areas, e.g biodiversity / benefits of glyphosate use.
484	CA 8.5	Nunez S. et al.	2015	In vitro effect of N-(phosphonomethyl) glycine agrochemicals on total heterotrophic bacteria and azotobacter chroococcum.	Biocell (2015), Vol. 39, Suppl. 1. Abstract No.: A71.	5.4.1 case b) Relevant but supplementary information: Endpoints based on the effects of glyphosate on bacteria in soil are not considered in the EU level ecotox risk assessmen for Annex I renewal.

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554	CA 8.5	Samal S. et al.	2019	Evaluating the effect of monocrotophos and glyphosate on microbial population and certain important exoenzyme activities in soil.	Journal of Environmental Biology (2019), Vol. 40, No. 2, pp. 226	5.4.1 case b) Relevant but supplementary information: Dosing information / purity of both active substances cannot be confirmed. Study not conducted according to a recognised guideline. Presented endpoints not relateable to an EU level risk assessment based on lack of soil characterisation.
594	CA 8.5	Sun Q. et al.	2012	Effects of typical herbicides on soil respiration and N2O emissions from soil added with different nitrogen fertilizers.	Huan jing ke xue= Huanjing kexue (2012), Vol. 33, No. 6, pp. 1994	5.4.1 case b) Relevant but supplementary information: The study uses soil from fields in China, without describing the history of the fields (e.g. prior pesticide and fertilizer use), soil sampling, and soil storage conditions prior to the start of the experiment. Soil characteristics are unclear as no information on e.g. CEC and water holding capacity is available. The study was not conducted to a relevant guideline and thus no validity criteria are available. A negative control was included, but no information on replicates is available and only one test item concentration was tested. No positive control was tested. Application of the test item is not described well, the active substance content of the test item is not given and no verification of applied test amount was performed. Finally, there is no quantifiable endpoint presented.
187	CA 8.6	Aguilar-Dorantes K. et al.	2015	Glyphosate Susceptibility of Different Life Stages of Three Fern Species	American fern journal (2015), Vol. 105, No. 3, pp. 131	5.4.1 case b) Relevant but supplementary information: Considered supplementary as species not relateable to an EU level risk assessment for Annex I renewal.
195	CA 8.6	Allison J. E. et al.	2013	Influence of soil organic matter on the sensitivity of selected wild and crop species to common herbicides.	Ecotoxicology ((2013), Vol. 22, No. 8, pp. 1289	5.4.1 case b) Relevant but supplementary information: Soils with a modified nutrient status were used which is not a requirement for the studies conducted to support the renewal in the EU.
219	CA 8.6	Barriuso J. et al.	2011	Effect of the herbicide glyphosate on the culturable fraction of glyphosate-tolerant maize rhizobacterial communities using two different growth media.	Microbes and environments (2011), Vol. 26, No. 4, pp. 332	5.4.1 case b) Relevant but supplementary information: The study was a comparison between glyphosate and Harness GTZ (pre-emergence herbicide). glyphosate (Roundup plus) was applied at appropriate concentrations (360 g/kl, 0.72 kg/ha), the study looked at the rhizobacterial communities of glyphosate tolerant maize. The study was not to any relevant guideline and did not provide an endpoint relevant to the renewal of glyphosate.
232	CA 8.6	Bott S. et al.	2011	Phytotoxicity of glyphosate soil residues re-mobilised by phosphate fertilisation	Plant and soil (2011), Vol. 342, No. 1-2, pp. 249	5.4.1 case b) Relevant but supplementary information: Roundup ultra max (360 g/L, applied up to 4.8 mg ae/kg soil), study looked at the impact of phosphate and glyphosate competition in the soil and subsequent availability of NTTP and impact on soil characteristics (in different soil types) to soybean growth. AMPA is also considered in the article. However, a regulatory endpoint suitable for the renewal of glyphosate was not obtained from the article.

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255	CA 8.6	Carvalho L. B. et al.	2016	Plant Growth Responses of Apple and Pear Trees to Doses of Glyphosate	Planta Daninha (2016), Vol. 34, No. 4, pp. 815	5.4.1 case b) Relevant but supplementary information: Study investigates the impact of spraying apple and pear saplings at rates up to 720 g/ha and assesses effects on yield. Spraying of sapling trees directly is not on the GAP table as a use, so whilst they may inform on the potential risk via drift, endpoint considered relevant to EU level risk assessment. The endpoints were not established using a test guideline considered relevant to EU renewal.
271	CA 8.6	Claassens A. et al.	2019	Soilborne glyphosate residue thresholds for wheat seedling metabolite profiles and fungal root endophyte colonisation are lower than for biomass production in a sandy soil.	Plant and Soil (2019), Vol. 438, No. 1/2, pp. 393	5.4.1 case b) Relevant but supplementary information: Presented information on effects of glyphosate on seedling emergence and soil fungi, but no specific endpoints are presented that could be used for the renewal ecotoxicological risk assessment.
354	CA 8.6	Helander M. et al.	2019	Glyphosate residues in soil affect crop plant germination and growth.	Scientific reports (2019), Vol. 9, No. 1, pp. 19653	5.4.1 case b) Relevant but supplementary information: The study presents endpoints that may be considered relevant to a risk assessment, however, the test design does not reflect the seedling emergence study required as part of the data requirements.
385	CA 8.6	Kennedy E. et al.	2012	Herbiciding Phragmites australis: effects on litter decomposition, microbial biomass, and macroinvertebrate communities.	Fundamental and Applied Limnology (2012), Vol. 180, No. 4, pp. 309	5.4.1 case b) Relevant but supplementary information: This paper provides information that is considered relevant to the biodiversity.
433	CA 8.6	Lin JingWen et al.	2015	Toxic effect of glyphosate on seed germination and seedling growth of Chinese fir.	Acta Agriculturae Universitatis Jiangxiensis (2015), Vol. 37, No. 5, pp. 843	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP, but it is well documented although no relevant guidelines have been followed. The authors state that the seed germination rate as well as the root length, stem length, leaf length and fresh weight of seedlings decreased significantly with the increase of glyphosate and the root length was more sensitive to glyphosate than other indexes. It was concluded that there is an inhibitory effect of glyphosate on Chinese fir seeds and seedlings, which led to antioxidant enzyme dysfunction, oxidative damage of cells and reduced chlorophyll synthesis. No analytical verification of the test item concentrations was performed, and the findings do not generate endpoints relevant to the regulatory risk assessment of glyphosate.
500	CA 8.6	Panettieri M. et al.	2013	Glyphosate effect on soil biochemical properties under conservation tillage	Soil & tillage research (2013), Vol. 133, pp. 16	5.4.1 case b) Relevant but supplementary information: The paper describes different tillage techniques following use of glyphosate and the impact on soil properties. Not relateable directly to risk assessment for renewal but may be useful in the biodiversity and benefits discussions.
516	CA 8.6	Piotrowicz-Cieslak A. I. et al.	2010	Different Glyphosate Phytotoxicity of Seeds and Seedlings of Selected Plant Species.	Polish Journal of Environmental Studies (2010), Vol. 19, No. 1, pp. 123	5.4.1 case b) Relevant but supplementary information: Study to compare the effect of glyphosate on plant growth parameters of 6 plant species.

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562	CA 8.6	Schwan-Stoffel A. V. et al.	2012	The effect of herbicides on the germination of urediniospores of Phakopsora Pachyrhizi SYD. & P. SYD. Original Title: Germinacao de Phakopsora Pachyrhizi SID. & P. SID. Sob diferentes herbicidas.	Arquivos do Instituto Biologico Sao Paulo (2012), Vol. 79, No. 3, pp. 381	5.4.1 case b) Relevant but supplementary information: Study describes the impacts of glyphosate on germination of plant pathogen spores.
259	CA 8.6.2	Cavusoglu K. et al.	2011	Investigation of toxic effects of the glyphosate on Allium cepa.	Tarim Bilimleri Dergisi (2011), Vol. 17, No. 2, pp. 131	5.4.1 case b) Relevant but supplementary information: Glyphosate products were used in the study. Impact on seed germination and root growth.
365	CA 8.6.2	Jain S. et al.	2012	Herbicidal action on germination, amylase activity and gibberellin level in Cajanus cajan (L.).	Bioscience Discovery Journal (2012), Vol. 3, No. 2, pp. 232	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP and the test substance source and identity could not be verified. The study has not been conducted according to a recognized test guideline and there are no validity criteria presented. The authors state that glyphosate affects the level of gibberellin and amylase activity, as well as causing the food reserve content of seedlings to decrease gradually with increase in concentration. However, given the lack of standard guidelines, unclear experimental design and approach, test substance and dose rates not sufficiently being reported as well as challenges in interpreting the study results, make reaching any reliable conclusions from the study quite challenging.
552	CA 8.6.2	Salgado T. P. et al.	2011	Initial symptoms of Eucalyptus intoxication by glyphosate rates applied on the stem or leaves. Sintomas da intoxicacao inicial de Eucalyptus proporcionados por subdoses de glyphosate aplicadas no caule ou nas folhas.	Planta Daninha (2011), Vol. 29, No. 4, pp. 913	5.4.1 case b) Relevant but supplementary information: Effects on eucalyptus seedlings after application of glyphosate (Roundup Original, 360 g a.e./L). Spraying the aerial part of the plants (trials 3 and 4). Plant BBCH stage unclear (hight at start of application: 40/ 69 cm). No biological results for control or any test concentration reported in tables. Therefore the results cannot be reproduced. No results in values which can be used for the risk assessment.
612	CA 8.6.2	Truta E. et al.	2011	Evaluation of Roundup-induced toxicity on genetic material and on length growth of barley seedlings.	Acta biologica Hungarica (2011), Vol. 62, No. 3, pp. 290	5.4.1 case b) Relevant but supplementary information: Impact of glyphosate product on barley seedling development. Unclear how endpoint could be used in risk assessment.
280	CA 8.7	Damgaard C. et al.	2014	The effect of glyphosate on the growth and competitive effect of perennial grass species in semi-natural grasslands.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2014), Vol. 49, No. 12, pp. 897	5.4.1 case b) Relevant but supplementary information: Not directly relevant to Ecotox risk assessment, but maybe used in biodiversity discussion.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
309	CA 8.7	Druart C. et al.	2011	Glyphosate and glufosinate-based herbicides: fate in soil, transfer to, and effects on land snails	Journal of soils and sediments (2011), Vol. 11, No. 8, pp. 1373	5.4.1 case b) Relevant but supplementary information: The material and methods part lack some important information. The test design for the exposure of snails to treated food is not specified and thus the intake dose per snail is unclear. Furthermore, the application of the test solutions into the soil is not reported and an even distribution cannot be confirmed. Nevertheless a chemical analysis of the soil during exposure was performed. As the biological data does not report results as an endpoint useful for the risk assessment, the study is not done to a guideline and is non-GLP and can be considered as supplementary only.
313	CA 8.7	Emmanuel L. D. A. et al.	2015	Effect of glyphosate on Bacillus megaterium with reference to tea ecosystem.	International Journal of Tea Science (2015), Vol. 11, No. 3/4, pp. 16	5.4.1 case b) Relevant but supplementary information: Endpoints are not releateable to an EU ecotox risk assessment, but may inform on discussions over community level effects in soil.
364	CA 8.7	Jacques M. T. et al.	2019	Reprotoxicity of glyphosate-based formulation in Caenorhabditis elegans is not due to the active ingredient only.	Environmental pollution (2019), Vol. 252, No. Pt B, pp. 1854	5.4.1 case b) Relevant but supplementary information: The toxicity of glyphosate (glyphosate in monoisopropylamine salt) and its commercial formulation Termifin - Dexter Latina to the nematode Caenorhabditis elegans was investigated. Reproductive capacity was evaluated by means of brood size. The material and methods section lack some important information. The preparation of the test solutions and application of the test item are not described. Test concentrations, controls and loading per replicate are not specified and therefore not verifiable. Description of exposure throughout the study is also missing. The formulation used is not the representative formulation for the renewal. Furthermore, no useful endpoint for the regulatory risk assessment of terrestrial organisms can be derived.
533	CA 8.7	Ranganathaswamy M. et al.	2012	Evaluation of toxicity of agrochemicals on Trichoderma isolates in vitro.	Journal of Biological Control (2012), Vol. 26, No. 4, pp. 391	5.4.1 case b) Relevant but supplementary information: The form of glyphosate used in the experiments cannot be confirmed. Fungal growth inhibition is not part of the specific ecotox risk assessment for the renewal.
297	CA 8.9	Dennis P. G. et al.	2018	The effects of glyphosate, glufosinate, paraquat and paraquat-diquat on soil microbial activity and bacterial, archaeal and nematode diversity	Scientific Reports (2018), Vol. 8, pp. 1	5.4.1 case b) Relevant but supplementary information: Nematode abundance is not an endpoint used in Ecotox risk assessment. However, these data are considered relevant to soil community effects based on single applications. Article is considered supplementary, as the approach used is not a recognised approach for ecotox risk assessment.
528	CA 8.9	Rahman F. et al.	2019	Evaluation of Glyphosate Levels in Sediments of Milky Stork Foraging Areas in Kuala Gula Bird Sanctuary, Perak, Malaysia.	Pertanika Journal of Tropical Agricultural Science (2019), Vol. 42, No. 3, pp. 995	5.4.1 case b) Relevant but supplementary information: Considered relevant but supplemental as this relates to biodiversity irrespective of not deriving from an EU country.

No	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
570	CP 10.3.2	Siddhapara M. R. et al.	2012	Toxicity of some commonly used insecticides/herbicides on Zygogramma bicolorata Pallister (Coleoptera: Chrysomelidae).	Journal of Biological Control (2012), Vol. 26, No. 3, pp. 251	5.4.1 case b) Relevant but supplementary information: The source of the beetles used was not adequately described. The source and purity of the glyphosate test substance was not described, preventing confirmation ofthe exposure concentrations used in the test. There was insufficient description of the test system to enable comparison with existing test guidelines to establish acceptability of the approach used. Analytical verification of the exposure concentrations was not performed. No endpoint can be derived from the study. The sudy is considered as supplementary only.

Table 35: Relevant but supplementary (category B) articles after detailed assessment: sorted by author(s)

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
180	Abdulkareem S. I. et al.	CA 8.2.8	2015	Histopathological effects of lethal and sub-lethal concentrations of glyphosate on gills and liver of African catfish, Clarias gariepinus.	Journal of Aquatic Sciences (2015), Vol. 30, No. 1, pp. 53	5.4.1 case b) Relevant but supplementary information: Although blood, gill and liver enzyme levels are not relatable to an EU level ecotoxicological risk assessment for Annex I renewal purposes, the study was considering acute effects and chronic sublethal effects on fish following exposure to glyphosate. The study has not been conducted according to a recognised test guideline and there are no validity criteria presented. The environmental holding conditions (water quality) for the fish prior to and during the study were not included. The fish loading rate (g/fish L) was 20.5 g fish/L, which far exceeds the loading rate required for chronic static renewal fish tests. The typical loading rates for studies submitted to support regulatory submission for Annex I renewals in the EU are 0.8 to 1.0 g fish/L. The impact of such high fish densities cannot be established, as no water quality measurements were included in ther paper, such as the dissolved oxygen levels (mgO2/L) and pH values. There was no test substance information presented, glyphosate concentrations were not measured / confirmed during the 28 day study duration. Behavioural observations in test vessels could not be related to the nominal exposure concentration. Finally, there were no quantifiable endpoints presented in the paper, considered applicable to an EU level ecotoxicological risk assessment for renewal purposes.
181	Abdulkareem S. I. et al.	CA 8.2.8	2013	Effects of sub-lethal concentrations of glyphosate on behaviour and some biochemical parameters of African catfish (Clarias gariepinus)	Proceedings of the 28th annual conference of the Fisheries Society of Nigeria (2013), pp. 188	5.4.1 case b) Relevant but supplementary information: Although blood, gill and liver enzyme levels are not relatable to an EU level ecotoxicological risk assessment the renewal purposes, the study was considered as supplemental due to the sublethal effects on fish behaviour following exposure to glyphosate. The study has not been conducted according to a recognised test guideline and there are no validity criteria presented. The fish species and their origin are not described and environmental conditions (water quality) for the fish prior to and during the study have not been included. The fish loading rate (g/fish L test medium) was 20.5 g fish/L, which far exceeds the loading rate required for chronic static renewal fish tests typically required for studies submitted to support regulatory submission for renewals in the EU (0.8 to 1.0 g fish/L). The impact of such high fish densities cannot be established, as no water quality measurements were provided such as levels of dissolved oxygen (mgO2/L) and pH. Similarly, there was no test substance information or rationale presented for the selection of exposure concentrations. glyphosate concentrations were also not measured / confirmed during the 28 day study duration. Behavioural observations relating to the swimming activity are not relatable to the nominal exposure

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						concentration. Finally, there are no applicable EU level ecotoxicological risk assessment quantifiable endpoints presented in the paper.
182	Abou-Amer W. L. et al.	CA 5.6	2010	Teratological effects induced by three pesticides in pregnant rats	Alexandria Journal of Pharmaceutical Sciences (2010), Vol. 24, No. 1, pp. 21	5.4.1 case b) Relevant but supplementary information: Supportive only: Study is done with pesticide formulations with only one dose per pesticide treatment group established. The study contains unsufficient data, therefore supplementary only.
183	Acquavella J. et al.	CA 5.5	2018	Corrigendum to: Glyphosate epidemiology expert panel review: a weight of evidence systematic review of the relationship between glyphosate exposure and non-Hodgkin's lymphoma or multiple myeloma.	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 898	5.4.1 case b) Relevant but supplementary information: Corrigendum to Acquavella et al._2016, Critical Reviews in Toxicology (2016), Vol. 46, sup1, pp. 28-43.
184	Acquavella J. et al.	CA 5.9.4	2016	Glyphosate epidemiology expert panel review: a weight of evidence systematic review of the relationship between glyphosate exposure and non-Hodgkin's lymphoma or multiple myeloma.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 28	5.4.1 case b) Relevant but supplementary information: review, secondary source.
185	Adams R. D. et al.	CA 5.9.5	2013	The NPIS Pesticide Surveillance Project - Eye contact with pesticides: Circumstances of exposure and toxicity.	Clinical Toxicology (2013), Vol. 51, No. 4, pp. 353	5.4.1 case b) Relevant but supplementary information: This is a report describing ocular exposures to pesticides. Formulated glyphosate is expected to cause moderate conjunctivitis & irritation when the eye is exposed due to the surfactant. This should not impact re-registration.
186	Agbon A. O. I. et al.	CA 8.2.8	2014	The potential impact of Glyphosate on captured fisheries productivity and sustainability	Proceedings of the 29th annual conference of the Fisheries Society of Nigeria (2014), pp. 17	5.4.1 case b) Relevant but supplementary information: The study was not conducted according to a recognised acute test guideline and there are no validity criteria presented. The overall study duration was 35 days, from which a 96 hr LC50 value was determined. There are no data presented in the paper in terms of mortalities over the first 4 days from which a 96 hr LC50 could be determined. The fish also appear to have been fed for the 35 day duration, which is not in accordance with the recognised acute fish toxicity test guideline used according to the EU No. 283 2013 data requirements. The environmental holding conditions (water quality) for the fish prior to and during the study were not included. The fish loading rate (g/fish L) cannot be determined as no test vessel water volumes are presented. There are no water quality measurements included in ther paper, such as the dissolved oxygen levels (mgO2/L) and pH values. There was no test substance information presented, glyphosate concentrations were not measured / confirmed during the 35 day study duration. No sub-lethal behavioural observations were included in the paper. Finally, the presented endpoints cannot be confirmed from the presented information in the paper. The study is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
187	Aguilar-Dorantes K. et al.	CA 8.6	2015	Glyphosate Susceptibility of Different Life Stages of Three Fern Species	American fern journal (2015), Vol. 105, No. 3, pp. 131	5.4.1 case b) Relevant but supplementary information: Considered supplementary as species not relateable to an EU level risk assessment for Annex I renewal.
188	Ahmed A. A. et al.	CA 7.1.3.1.1	2018	Unravelling the nature of glyphosate binding to goethite surfaces by ab initio molecular dynamics simulations.	Physical chemistry chemical physics (2018), Vol. 20, No. 3, pp. 1531	5.4.1 case b) Relevant but supplementary information: Explores possible binding mechanisms for glyphosate with three goethite surface planes (010, 001, and 100) in the presence of water. Supplementary and not directly relevant to EU risk assessment.
334	Ait Bali Y. et al.	CA 5.8	2017	Behavioral and Immunohistochemical Study of the Effects of Subchronic and Chronic Exposure to Glyphosate in Mice.	Frontiers in behavioral neuroscience (2017), Vol. 11, pp. 146	5.4.1 case b) Relevant but supplementary information: Formulation tested (Roundup, 486 g/L isopropylamine salt, 360 g/L a.e.) in vivo.
190	Alexa E. et al.	CA 7.1.2.1.1	2010	Research on the weed control degree and glyphosate soil biodegradation in apple plantations (Pioneer variety).	Analele Universitatii din Oradea, Fascicula Biologie (2010), Vol. 17, No. 1, pp. 5	5.4.1 case b) Relevant but supplementary information: Only glyphosate mineralization analyzed (measurement of 14CO2), no details on soil characteristics or experimental set-up reported.
191	Alhewairini S. S.	CA 8.2.4	2017	Toxicity of the herbicide glyphosate to non-target species Caenorhabditis elegans.	Journal of Food, Agriculture & Environment (2017), Vol. 15, No. 2, pp. 97	5.4.1 case b) Relevant but supplementary information: The study has not been conducted according to a recognised test guideline and there are no validity criteria presented. The generated endpoints are not based on direct effects on the nematode, but instead, are based on the optical density related to the density of bacteria present in the NGM ajar test cultures. It is unclear if the presented mortality data were due to direct effects of glyphosate in the cultures, or due to indirect effects associated with reduced feeding activity. There was no test substance information presented and glyphosate concentrations were not measured / confirmed during the study. Finally, there were no quantifiable endpoints presented in the paper, that would be considered applicable to an EU level ecotoxicological risk assessment.
192	Alishahi M. et al.	CA 8.2.1	2019	Comparative toxicities of five herbicides on nauplii of Artemia franciscana as an ecotoxicity bioindicator.	IRANIAN JOURNAL OF FISHERIES SCIENCES (2019), Vol. 18, No. 4, pp. 716	5.4.1 case b) Relevant but supplementary information: The material and methods section lack some important information. OECD standard methods were mentioned in the publication; however, the test guideline or specific validity criteria were not specified. Furthermore, information on preparation, application of the test item or exposure conditions are missing. No results for the control group are available to put the biological effects in context. Also no mortality results for all treatment group are given. At the end of the test, an endpoint was derived, but further statistical information (assessment of statistical power, confidence intervals) are not stated. Furthermore, there was no analytical verification of test concentrations reported. The study is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
193	Alishahi M. et al.	CA 8.2.1	2016	Acute toxicity evaluation of five herbicides: paraquat, 2,4-dichlorophenoxy acetic acid (2,4-D), trifluralin, glyphosite and atrazine in Luciobarbus esocinus fingerlings.	Iranian Journal of Veterinary Medicine (2016), Vol. 10, No. 4, pp. 319	5.4.1 case b) Relevant but supplementary information: Although the study was stated to have been conducted according to a recognised test guideline (OECD 203), no validity criteria was presented. The selected fish species and their approximate origin are described but environmental holding conditions (water quality) for the fish handling prior to and during the study were not included. There was limited test substance information presented, with no rationale presented for the selection of exposure concentrations. glyphosate concentrations were also not measured/confirmed during the evaluation period. Behavioural observations relating to the lethargy and swimming behaviour are not considered directly relatable to the nominal exposure concentration. The study is considered unreliable.
194	Alleva R. et al.	CA 5.8.2	2018	Mechanism underlying the effect of long-term exposure to low dose of pesticides on DNA integrity.	Environmental Toxicology (2018), Vol. 33, No. 4, pp. 476	5.4.1 case b) Relevant but supplementary information: Purity and source not reported. No positive control. Only one or two concentrations of glyphosate were tested. Comparisons are to untreated cells rather than negative controls. The reliability of the study is unassignable.
195	Allison J. E. et al.	CA 8.6	2013	Influence of soil organic matter on the sensitivity of selected wild and crop species to common herbicides.	Ecotoxicology ((2013), Vol. 22, No. 8, pp. 1289	5.4.1 case b) Relevant but supplementary information: Soils with a modified nutrient status were used which is not a requirement for the studies conducted to support the renewal in the EU.
196	Alvarez-Moya C. et al.	CA 5.4	2014	Comparison of the in vivo and in vitro genotoxicity of glyphosate isopropylamine salt in three different organisms.	Genetics and molecular biology (2014),Vol. 37, No. 1, pp. 105	5.4.1 case b) Relevant but supplementary information: Mechanistic study without clear relevance for the risk assessment.
197	Amaral M. J. et al.	CA 8.1.4	2012	The use of a lacertid lizard as a model for reptile ecotoxicology studies - Part 1 Field demographics and morphology	Chemosphere (2012), Vol. 87, No. 7, pp. 757	5.4.1 case b) Relevant but supplementary information: This study reports results from a long term population monitoring study. The endpoints are such that it difficult to relate to an ecotox risk assessment for Annex I reneweal purposes, but is supportive from a population level perspective.
198	Andreotti G. et al.	CA 5.8.2	2012	The interaction between pesticide use and genetic variants involved in lipid metabolism on prostate cancer risk	Journal of Cancer Epidemiology (2012), Article ID 358076, pp 1	5.4.1 case b) Relevant but supplementary information: Mechanism of measuring toxicity is not data requirement of (EC) 1107/2009; performed in a non-relevant test model.
199	Anifandis G. et al.	CA 5.8.2	2018	The effect of glyphosate on human sperm motility and sperm DNA fragmentation	International Journal of Environmental Research and Public Health (2018), Vol. 15, No. 6, pp. 1117/1	5.4.1 case b) Relevant but supplementary information: The glyphosate used is not characterized, only one test concentration was used, no positive control was considered and the results obtained are not corroborated by in vivo regulatory reproductive toxicology studies with much higher systemic levels of glyphosate. This publication is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
200	Anon.	CA 5.5	2018	Expression of Concern (26 September 2018): An Independent Review of the Carcinogenic Potential of Glyphosate.	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 981	5.4.1 case b) Relevant but supplementary information: Expression of concern regarding articles Williams et al_2016, Crit Rev Toxicol (2016), 46(S1):3-20 and Solomon et al._2016, Crit Rev Toxicol (2016), 46(S1):21-27 and Acquavella et al_2016, Crit Rev Toxicol (2016), 46(S1):28-43 and Willliams et al._2016, Crit Rev Toxicol (2016), 46(S1):44-55. and Brusick et al_2016, Crit Rev Toxicol (2016), 46(S1):56-74.
201	Aris A.	CA 5.9.1	2012	Response to comments from Monsanto scientists on our study showing detection of glyphosate and Cry1Ab in blood of women with and without pregnancy	Reproductive Toxicology (2012), Vol. 33, No. 1, pp. 122	5.4.1 case b) Relevant but supplementary information: Correspondence with no new data.
202	Arjo G. et al.	CA 5.5	2013	Plurality of opinion, scientific discourse and pseudoscience: an in depth analysis of the Seralini et al. study claiming that Roundup® Ready corn or the herbicide Roundup® cause cancer in rats.	Transgenic research (2013), Vol. 22, No. 2, pp. 255	5.4.1 case b) Relevant but supplementary information: Discussion providing context to a controversial retracted publication.
203	Armbruster D. et al.	CA 7.5	2019	Characterization of phosphonate-based antiscalants used in drinking water treatment plants by anion-exchange chromatography coupled to electrospray ionization time-of-flight mass spectrometry and inductively coupled plasma mass spectrometry.	Journal of chromatography A (2019), Vol. 1601, pp. 189	5.4.1 case b) Relevant but supplementary information: Article is primarily about identification of impurities in anti-scaling products used in drinking water treatment. AMPA is identified as being present in some antiscalants at concentrations from 1.9 to 157 mg/L after 10,000 fold dilution of the commercial antiscalants. Information may be used qualitatively but not directly for EU risk assessments.
204	Arroyave J. M. et al.	CA 7.1.3.1.1	2016	Effect of humic acid on the adsorption/desorption behavior of glyphosate on goethite. Isotherms and kinetics.	Chemosphere (2016), Vol. 145, pp. 34	5.4.1 case b) Relevant but supplementary information: Study of effects of humic acid (HA) on the adsorption/desorption of glyphosate (glyphosate) on goethite. Not related to efate guideline, but supplemental information on glyphosate sorption.
205	Ascolani Y. J. et al.	CA 7.2.1	2014	Abiotic degradation of glyphosate into aminomethylphosphonic acid in the presence of metals.	Journal of agricultural and food chemistry (2014), Vol. 62, No. 40, pp. 9651	5.4.1 case b) Relevant but supplementary information: The paper is about abiotic degradation of glyphosate into AMPA in the presence of metals but it does not change the risk assessment.
206	Aslam S. et al.	CA 7.1.4	2018	Mulch of plant residues at the soil surface impact the leaching and persistence of pesticides: A modelling study from soil columns.	Journal of contaminant hydrology (2018), Vol. 214, pp. 54	5.4.1 case b) Relevant but supplementary information: Model developed to predict glyphosate degradation / movement in presence of mulch. Not an EU validated model. Experimental data used to test the model were from a previous paper.
207	Aslam S. et al.	CA 7.5	2015	Effect of rainfall regimes and mulch decomposition on the dissipation and leaching of S-metolachlor and glyphosate: a soil column experiment.	Pest management science (2015), Vol. 71, No. 2, pp. 278	5.4.1 case b) Relevant but supplementary information: The study describes a soil column leaching tests with glyphosate in French soils. Glyphosate recovery from the soil column at Day 0 was only 52%. This recovery in not acceptable to draw further conclusions from the study. This publication is considered unreliable.
208	Avgerinou C. et al.	CA 5.9.4	2017	Occupational, dietary, and other risk factors for myelodysplastic syndromes in Western Greece.	Hematology (2017), Vol. 22, No. 7, pp. 419	5.4.1 case b) Relevant but supplementary information: A case-control study with non-blind interviewers results in both potential recall bias and interviewer bias. This publication is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
209	Avigliano L. et al.	CA 8.2.4	2014	Effects of glyphosate on growth rate, metabolic rate and energy reserves of early juvenile crayfish, Cherax quadricarinatus M.	Bulletin of environmental contamination and toxicology (2014), Vol. 92, No. 6, pp. 631	5.4.1 case b) Relevant but supplementary information: Enzymatic endpoints discussed that are not used in EU level assessment. Mortality and survival data not discussed in paper.
210	Avila-Vazquez M. et al.	CA 5.9.4	2015	Cancer and detrimental reproductive effects in an Argentine agricultural community environmentally exposed to glyphosate. Original Title: Cancer y trastornos reproductivos en una poblacion agricola argentina expuesta a glifosato.	Journal of Biological Physics and Chemistry (2015), Vol. 15, No. 3, pp. 97	5.4.1 case b) Relevant but supplementary information: There is no glyphosate use associations quantified, confounded by multiple pesticide uses, other local industry and local sanitation questions.
211	Ayanda O. I. et al.	CA 8.2.1	2015	Acute toxicity of glyphosate and paraquat to the African catfish (Clarias gariepinus, Teugels 1986) using some biochemical indicators	Tropical zoology (2015), Vol. 28, No. 4, pp. 152	5.4.1 case b) Relevant but supplementary information: The test items were not identified, therefore it is not clear what was actually tested and to which compound the effects / results can be assigned.
212	Babalola O. O. et al.	CA 8.1.4	2018	Comparative Early Life Stage Toxicity of the African Clawed Frog, Xenopus laevis Following Exposure to Selected Herbicide Formulations Applied to Eradicate Alien Plants in South Africa.	Archives of Environmental Contamination and Toxicology (2018), Vol. 75, No. 1, pp. 8	5.4.1 case b) Relevant but supplementary information: As the composition of the Roundup used in the test cannot be confirmed, the study must be considered as being supplementary. Original roundup contains a POEA surfactant which drives the toxicity of the product.
213	Bach N. C. et al.	CA 8.1.4	2016	Effect on the growth and development and induction of abnormalities by a glyphosate commercial formulation and its active ingredient during two developmental stages of the South-American Creole frog, Leptodactylus latrans.	Environmental science and pollution research international (2016), Vol. 23, No. 23, pp. 23959	5.4.1 case b) Relevant but supplementary information: Endpoint data presented for a formulated product other than the representative formulation for the Annex I. There are data indicated for glyphosate technical material, but this material is not identified in the materials and methods.
214	Baglan H. et al.	CA 8.3	2018	Glyphosate impairs learning in Aedes aegypti mosquito larvae at field-realistic doses.	The Journal of experimental biology (2018), Vol. 221, No. 20, pp 1	5.4.1 case b) Relevant but supplementary information: Information presented on the learning behaviour of mosquito larvae exposed to glyphosate. These data are difficult to relate to an EU level ecotox risk assessment for the renewal.
215	Baier C. J. et al.	CA 5.8	2017	Behavioral impairments following repeated intranasal glyphosate-based herbicide administration in mice.	Neurotoxicology and teratology (2017), Vol. 64, pp. 63	5.4.1 case b) Relevant but supplementary information: Formulation tested via intranasal administration.
216	Balbuena M. S. et al.	CA 8.3.1.4, CP 10.3.1.4	2015	Effects of sublethal doses of glyphosate on honeybee navigation.	The Journal of experimental biology (2015), Vol. 218, No. 17, pp. 2799	5.4.1 case b) Relevant but supplementary information: Due to the foraging nature of bees in the natural environment described in this study, the effects cannot be solely attributed to glyphosate active substance. However, the impact of bees from other substances foraging during the homing flight is considered negligible as they were exposed to the test substance for 1 hour prior to release. It is a possibility and the data generated using this new experimental design, should be considered with a degree of caution. Furthermore, there is no clear indication of the dose of glyphosate that the bees were exposed to as there was no analytical verification conducted in the study. This is a new experimental design and does not provide

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						relevant endpoints for the regulatory risk assessment of glyphosate Annex I renewal purposes. As there is no test guideline to which this study can be compared and as there is no data requirement nor approach to evaluate the findings of such a study at the regulatory level, the findings of this study should be considered with a degree of caution. The reliability assessment highlights that elements of the study may be considered reliable, but as there are no validity criteria against which this study can be assessed, nor data requirements relating to the achieved endpoints for Annex I renewal of plant protection products, the study must be considered non relevant for EU Annex I renewal purposes from an ecotoxicology risk assessment perspective.
217	Bando H. et al.	CA 5.9	2010	Extreme hyperkalemia in a patient with a new glyphosate potassium herbicide poisoning: report of a case.	The Japanese journal of toxicology (2010), Vol. 23, No. 3, pp. 246	5.4.1 case b) Relevant but supplementary information: This case report describes severe hyperkalemia in the setting of suicidal ingestion of potassium salt glyphosate formulations. This is not unexpected.
218	Bara J. J. et al.	CA 8.3	2014	Sublethal effects of atrazine and glyphosate on life history traits of Aedes aegypti and Aedes albopictus (Diptera: Culicidae).	Parasitology research (2014), Vol. 113, No. 8, pp. 2879	5.4.1 case b) Relevant but supplementary information: The test provides information on the impact of glyphosate on mosquito development, but the test design employed is not a recognised approach used for Annex I data generation for renewal purposes. Test item purity not stated, only pestanol grade. No chemical analysis.
219	Barriuso J. et al.	CA 8.6	2011	Effect of the herbicide glyphosate on the culturable fraction of glyphosate-tolerant maize rhizobacterial communities using two different growth media.	Microbes and environments (2011), Vol. 26, No. 4, pp. 332	5.4.1 case b) Relevant but supplementary information: The study was a comparison between glyphosate and Harness GTZ (pre-emergence herbicide). glyphosate (Roundup plus) was applied at appropriate concentrations (360 g/kl, 0.72 kg/ha), the study looked at the rhizobacterial communities of glyphosate tolerant maize. The study was not to any relevant guideline and did not provide an endpoint relevant to the renewal of glyphosate.
220	Bashir S. et al.	CA 5.5	2012	Final review of the Seralini et al. (2012a) publication on a 2-year rodent feeding study with glyphosate formulations and GM maize NK603 as published online on 19 September 2012 in Food and Chemical Toxicology	EFSA Journal (2012), Vol. 10, No. 11, pp. 2986	5.4.1 case b) Relevant but supplementary information: EFSA review of Seralini chronic rat study.
221	Bashir S. et al.	CA 5.5	2012	Review of the Seralini et al. (2012) publication on a 2-year rodent feeding study with glyphosate formulations and GM maize NK603 as published online on 19 September 2012 in Food and Chemical Toxicology	EFSA Journal (2012), Vol. 10, No. 10, pp. 2910	5.4.1 case b) Relevant but supplementary information: EFSA review of Seralini chronic rat study.
222	Beard J. D. et al.	CA 5.9.4	2014	Pesticide exposure and depression among male private pesticide applicators in the agricultural health study.	Environmental Health Perspectives (2014), Vol. 122, No. 9, pp. 984	5.4.1 case b) Relevant but supplementary information: No statistically significant findings for glyphosate.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
223	Beard J. D. et al.	CA 5.9.4	2013	Pesticide exposure and self-reported incident depression among wives in the Agricultural Health Study	Environmental Research (2013), Vol. 126, pp. 31	5.4.1 case b) Relevant but supplementary information: No statistically significant findings for glyphosate.
224	Belle R. et al.	CA 5.6	2012	Letter to the Editor: Toxicity of Roundup and glyphosate.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 4, pp. 233	5.4.1 case b) Relevant but supplementary information: Response to Letter to the Editor, comments on Williams et al_2012, J. Toxicol. nviron. Health B Crit. Rev (2012), Vol. 15, No. 1, pp. 39-96.
225	Bento C. P. M. et al.	CA 7.1.2.1.1, CA 7.1.2.1.4	2016	Persistence of glyphosate and aminomethylphosphonic acid in loess soil under different combinations of temperature, soil moisture and light/darkness.	The Science of the total environment (2016), Vol. 572, pp. 301	5.4.1 case b) Relevant but supplementary information: Supplementary information on the rate of degradation of glyphosate and rate of formation/dissipation of AMPA in loess soil as a function of temperature, soil moisture and light/darkness.
226	Berry C.	CA 5.5	2018	The complexities of regulatory toxicology	Outlooks on Pest Management (2018), Vol. 29, No. 6, pp. 270	5.4.1 case b) Relevant but supplementary information: No new data presented.
227	Berry C.	CA 5.5	2013	Comments on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 430	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol. (2012), retracted
228	Beswick E. et al.	CA 5.9	2011	Fatal poisoning with glyphosate-surfactant herbicide.	Journal of the Intensive Care Society (2011), Vol. 12, No. 1, pp. 37	5.4.1 case b) Relevant but supplementary information: This is a case of a young man who deliberately ingested glyphosate product at home and rapidly developed multi-organ failure, culminating in death. No new observations.
229	Boonsoong B. et al.	CA 8.2.4.1, CP 10.2.1	2012	Acute toxicity of Roundup and carbosulfan to the Thai fairy shrimp, Branchinella thailandensis.	Communications in agricultural and applied biological sciences (2012), Vol. 77, No. 4, pp. 431	5.4.1 case b) Relevant but supplementary information: The study was not conducted according to a recognised test guideline and no validity criteria are presented for control group performance, so the robustness of the assay can not be concluded. In the materials and methods, there is insufficient information presented on the test medium preparation approach and on the environmental conditions used in the test. There was no chemical analysis and therefore exposure cannot be confirmed. There are insufficient explanations provided on the experimental design, particularly environmental condition and conduct during the test. The study is considered unreliable.
230	Bortoli P. V. et al.	CA 8.5	2012	Effects of glyphosate on microbial community structure and activity in two soils under olive plantations. Original Title: Efectos del herbicida glifosato sobre la estructura y el funcionamiento de comunidades microbianas de dos suelos de plantaciones de olivo.	Ecologia Austral (2012), Vol. 22, No. 1, pp. 33	5.4.1 case b) Relevant but supplementary information: Paper presents information on the effects of glyphosate on respiration but the approaches used do not result in endpoints that can be used in an EU level risk assessment as they are based on Argentinian soils.
231	Bosak A. B. et al.	CA 5.9.5	2014	Clinical presentations with different glyphosate-containing herbicides.	Journal of Medical Toxicology (2014), Vol. 10, No. 1, pp. 72	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure after suicidal ingestion of formulated glyphosate and should not impact re-registration.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
232	Bott S. et al.	CA 8.6	2011	Phytotoxicity of glyphosate soil residues re-mobilised by phosphate fertilisation	Plant and soil (2011), Vol. 342, No. 1-2, pp. 249	5.4.1 case b) Relevant but supplementary information: Roundup ultra max (360 g/L, applied up to 4.8 mg ae/kg soil), study looked at the impact of phosphate and glyphosate competition in the soil and subsequent availability of NTTP and impact on soil characteristics (in different soil types) to soybean growth. AMPA is also considered in the article. However, a regulatory endpoint suitable for the renewal of glyphosate was not obtained from the article.
233	Boye K. et al.	CA 7.5	2019	Long-term data from the swedish national environmental monitoring program of pesticides in surface waters	Journal of Environmental Quality (2019), Vol. 48, pp. 1109	5.4.1 case b) Relevant but supplementary information: Describes pesticide analysis data and pesticide use information available for 4 small watersheds in Sweden. Data is available elsewhere but article provides a description of methodology and sources for data.
234	Braun C. et al.	CA 7.5	2013	The load from rail wastewater. Emissions of micropollutants from rail traffic into the watershed	Aqua & Gas (2013), Vol. 93, No. 7/8, pp. 40	5.4.1 case b) Relevant but supplementary information: No new glyphosate water concentrations are presented. Using worst-case measured values, glyphosate concentrations are predicted in various size flowing water bodies.
235	Brennan J. C. et al.	CA 5.8.3	2016	Development of a recombinant human ovarian (BG1) cell line containing estrogen receptor α and β for improved detection of estrogenic/antiestrogenic chemicals	Environmental Toxicology and Chemistry (2016), Vol. 35, No. 1, pp. 91	5.4.1 case b) Relevant but supplementary information: Limited data on glyphosate.
236	Brock A. L. et al.	CA 7.2.2.3	2019	Microbial Turnover of Glyphosate to Biomass: Utilization as Nutrient Source and Formation of AMPA and Biogenic NER in an OECD 308 Test.	Environmental science & technology (2019), Vol. 53, No. 10, pp. 5838	5.4.1 case b) Relevant but supplementary information: Uses data from another study (Wang, 2016) to test model to predict glyphosate mineralisation, degradation, and incorporation into non-extractable residues. Not directly relevant to EU risk assessment.
237	Brunetti R. et al.	CA 5.9.5	2019	Electrocardiographic abnormalities associated with acute glyphosate toxicity.	HeartRhythm Case Rep. (2020), Vol. 6, pp. 63	5.4.1 case b) Relevant but supplementary information: This article claims that dermal exposure to a small amount of glyphosate led to cardiac arrhythmia and claims that the patient developed a Brugada syndrome & long Qt syndrome after exposure. The measured QTC in a wide-complex tracing is uninterpretable. Brugada syndrome is largely due to sodium channel block in cardiac myocytes, LQT syndrome is largely due to potassium channel block in the cardiac myoctyes. Glyphosate does neither. Moreover, glyphosate is not dermally absorbed and multiple GLP studies have shown that glyphosate is not cardiotoxic.
238	Brusick D. et al.	CA 5.4	2016	Genotoxicity Expert Panel review: weight of evidence evaluation of the genotoxicity of glyphosate, glyphosate-based formulations, and aminomethylphosphonic acid.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 56	5.4.1 case b) Relevant but supplementary information: review, secondary source.
239	Brusick D. et al.	CA 5.5	2018	Corrigendum to: Genotoxicity Expert Panel review: weight of evidence evaluation of the genotoxicity of glyphosate, glyphosate-based formulations, and aminomethylphosphonic acid.	Critical Reviews in Toxicology (2018), Vol. 46, No. 10, pp 902	5.4.1 case b) Relevant but supplementary information: Corrigendum to Brusick et al._2016, Critical Reviews in Toxicology (2016), Vol. 46, sup1, pp. 56-74

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
240	Burstyn I. et al.	CA 5.5	2017	Visualizing the heterogeneity of effects in the analysis of associations of multiple myeloma with glyphosate use. comments on sorahan, t. multiple myeloma and glyphosate use: A re-analysis of us agricultural health study (AHS) data.	International Journal of Environmental Research and Public Health (2017), Vol. 14, No. 1, pp. 1	5.4.1 case b) Relevant but supplementary information: Re-analysis of old data, no statistically significant glyphosate findings. A re-analysis of US agricultural health study (AHS) data. Int. J. Environ. Res. Public Health (2015), Vol. 12, pp. 1548
241	Bus J. S.	CA 5.5	2017	IARC use of oxidative stress as key mode of action characteristic for facilitating cancer classification: Glyphosate case example illustrating a lack of robustness in interpretative implementation.	Regulatory toxicology and pharmacology (2017), Vol. 86, pp. 157	5.4.1 case b) Relevant but supplementary information: review, secondary source.
242	Bus J. S.	CA 5.9.2	2015	Analysis of Moms Across America report suggesting bioaccumulation of glyphosate in U.S. mother's breast milk: Implausibility based on inconsistency with available body of glyphosate animal toxicokinetic, human biomonitoring, and physico-chemical data.	Regulatory toxicology and pharmacology (2015), Vol. 73, No. 3, pp. 758	5.4.1 case b) Relevant but supplementary information: review, secondary source.
243	Caballero M. et al.	CA 5.9.4	2018	Estimated Residential Exposure to Agricultural Chemicals and Premature Mortality by Parkinson's Disease in Washington State.	International journal of environmental research and public health (2018), Vol. 15, No. 12, pp. 1	5.4.1 case b) Relevant but supplementary information: Unproven exposure. Uncertain temporal relationship between purported exposure and the health outcome. Appropriate design would evaluate exposure or non-exposure from Parkinson's diagnosis and compare length of survival by exposure category.
244	Caganova B. et al.	CA 5.9.5	2017	Caustic effects of chemicals: risk factors for complications and mortality in acute poisoning	Monatshefte fuer Chemie (2017), Vol. 148, No. 3, pp. 497	5.4.1 case b) Relevant but supplementary information: This article discusses caustic injury in suicide attempts and therefore should not impact registration decisions.
245	Caganova B. et al.	CA 5.9.5	2017	Caustic ingestion in the elderly: influence of age on clinical outcome	Molecules (2017), Vol. 22, No. 10, pp. 1726/1	5.4.1 case b) Relevant but supplementary information: This article compares outcomes of caustic ingestions in young to elderly patients and it demonstrates that there is a higher mortality in the older group. Glyphosate is mentioned in a table where there were 9 ingestions with no fatalities in the younger group and 2 fatalities in the elderly. This article discusses suicidal ingestions of caustic substances and should therefore not impact re-registration.
246	Cai W. et al.	CA 5.6	2017	Effects of glyphosate exposure on sperm concentration in rodents: A systematic review and meta-analysis.	Environmental toxicology and pharmacology (2017), Vol. 55, pp. 148	5.4.1 case b) Relevant but supplementary information: Re-evaluation of pooled literature data.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
247	Cai W. et al.	CA 5.9.4	2020	Correlation between CYP1A1 polymorphisms and susceptibility to glyphosate-induced reduction of serum cholinesterase: A case-control study of a Chinese population.	Pesticide biochemistry and physiology (2020), Vol. 162, pp. 23	5.4.1 case b) Relevant but supplementary information: Untenable assumption for the genetic analyses: that ChE depression (viz., case status) is related to glyphosate. Note that ChE depression is not more likely among those with longest glyphosate employment tenure. Adequate description of study population is uncertain. Selection process not clearly described. Adequate description of exposure circumstances is uncertain. Description of workplaces lacking. Subjects could have worked primarily in producing raw materials. This publication is considered unreliable.
248	Caloni F. et al.	CA 5.8	2016	Suspected poisoning of domestic animals by pesticides.	The Science of the total environment (2016), Vol. 539, pp. 331	5.4.1 case b) Relevant but supplementary information: Review article on domestic animal poisonings by pesticides.
249	Campuzano C. et al.	CA 5.9.2	2017	Efectos de la intoxicacion por glifosato en la poblacion agricola: revision de tema	Revista CES Salud Publica (2017), Vol. 8, No. 1, pp. 121	5.4.1 case b) Relevant but supplementary information: This article claims that occupational exposure to glyphosate formulations is associated with multi-organ toxicity via suicidal ingestions and a literature review to support their claim. In suicide attempts, glyphosate based formulations are known to cause caustic injury leading to multi-organ failure. However, occupational exposures do not, nor do they lead to chronic long term effects. The Ag Health Study from 2005 & 2018 demonstrate no evidence of carcinogenicity. The Farm Family Exposure Study shows that there is minimal absorption of glyphosate in the occupational setting.
250	Carbajal-Lopez Y. et al.	CA 5.4	2016	Biomonitoring of agricultural workers exposed to pesticide mixtures in Guerrero state, Mexico, with comet assay and micronucleus test	Environmental Science and Pollution Research (2016), Vol. 23, No. 3, pp. 2513	5.4.1 case b) Relevant but supplementary information: No glyphosate specific conclusions, confounded due to multiple pesticide uses.
251	Carles L. et al.	CA 7.5	2019	Meta-analysis of glyphosate contamination in surface waters and dissipation by biofilms.	Environment international (2019), Vol. 124, pp. 284	5.4.1 case b) Relevant but supplementary information: High phosphorus concentrations in surface water can reduce complete glyphosate degradation by biofilms and favour the accumulation of AMPA in river water.
252	Carrasco A. E.	CA 8.1.5	2011	Reply to the letter to the editor regarding our article (Paganelli et al., 2010).	Chemical research in toxicology (2011), Vol. 24, No. 5, pp. 610	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Reply to Paganelli et al., 2010, Paganelli et al. Chem. Res. Toxicol (2010), Vol. 23, pp. 1586-1595.
253	Carretta L. et al.	CA 7.1.4	2019	A new rapid procedure for simultaneous determination of glyphosate and AMPA in water at sub µg/L level.	Journal of chromatography. A (2019), Vol. 1600, pp. 65	5.4.1 case b) Relevant but supplementary information: Analytical method. Analyzed runoff samples from the Po River Valley in Italy. Only ranges of values provided not individual values. Indicates glyphosate concentrations are lower in the presence of a buffer strip than without buffer strip.
254	Carroll R. et al.	CA 5.9.5	2012	Diurnal variation in probability of death following self-poisoning in Sri Lanka--evidence for chronotoxicity in humans.	International journal of epidemiology (2012), Vol. 41, No. 6, pp. 1821	5.4.1 case b) Relevant but supplementary information: This article discusses the concept of chronotoxicity in overdoses. They found no evidence of circadian effects on glyphosate overdoses. This article discusses suicidal ingestions and therefore should not impact registration decisions.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
255	Carvalho L. B. et al.	CA 8.6	2016	Plant Growth Responses of Apple and Pear Trees to Doses of Glyphosate	Planta Daninha (2016), Vol. 34, No. 4, pp. 815	5.4.1 case b) Relevant but supplementary information: Study investigates the impact of spraying apple and pear saplings at rates up to 720 g/ha and assesses effects on yield. Spraying of sapling trees directly is not on the GAP table as a use, so whilst they may inform on the potential risk via drift, endpoint considered relevant to EU level risk assessment. The endpoints were not established using a test guideline considered relevant to EU renewal.
256	Castilhos R. V. et al.	CA 8.3	2014	Selectivity of pesticides used in peach orchards on eggs and pupae of the predator Chrysoperla externa. Seletividade de agrotoxicos utilizados em pessegueiro sobre ovos e pupas do predador Chrysoperla externa.	Ciencia Rural (2014), Vol. 44, No. 11, pp. 1921	5.4.1 case b) Relevant but supplementary information: The glyphosate product was concluded to be harmless to Chrysoperla and Chrysoperla eggs and pupae. The study was not conducted according to GLP and the study design lacks some details compared with relevant guidelines. The test concentrations are based on nominal values and no analytical verification of test item concentrations was conducted. Although the test design is described in quite some detail, some important information is missing, i.e. regarding the source and content of the applied products, the application of test item and control data are not shown for all parameters. Additionally, according to IOBC/WPRC larval stages should be exposed. As the study is based on a glyphosate product, the toxicity of glyphosate active substance alone is unknown and therefore endpoints generated from this study are not quantifiable and deliver only supplementary information.
257	Castilhos R. V. et al.	CA 8.3.2, CP 10.3.2	2011	Selectivity of pesticides used in peach orchard on adults of Chrysoperla externa (Hagen, 1861) (Neuroptera: Chrysopidae). Original title: Seletividade de agrotoxicos utilizados em pomares de pessego a adultos do predador Chrysoperla externa (Hagen, 1861) (Neuroptera: Chrysopidae).	Revista Brasileira de Fruticultura (2011), Vol. 33, No. 1, pp. 73	5.4.1 case b) Relevant but supplementary information: Roundup (and many other pesticides) were used as the test substance. Only mortality of lacewing were assessed. Likewise no reproduction endpoints were evaluated and thus no data is relevant to the risk assessment.
258	Cattaneo R. et al.	CA 8.2	2011	Toxicological responses of Cyprinus carpio exposed to a commercial formulation containing glyphosate.	Bulletin of environmental contamination and toxicology (2011), Vol. 87, No. 6, pp. 597	5.4.1 case b) Relevant but supplementary information: Roundup (480 g/L contains surfactant) used up to 10 mg/L with common carp to look at impact on AChE enzyme and physiological effects. Study described well but not conducted to a guidline and the endpoints can not be extrapolated for use in the renewal of glyphosate. Conducted outside EU.
259	Cavusoglu K. et al.	CA 8.6.2	2011	Investigation of toxic effects of the glyphosate on Allium cepa.	Tarim Bilimleri Dergisi (2011), Vol. 17, No. 2, pp. 131	5.4.1 case b) Relevant but supplementary information: Glyphosate products were used in the study. Impact on seed germination and root growth.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
260	Cebotari V. et al.	CA 6.10.1	2018	Content of pesticide residues in the flowers of the acacia and linden trees from the Moldavian Codri area.	Scientific Papers, Series D. Animal Science (2018), Vol. 61, No. 2, pp. 235	5.4.1 case b) Relevant but supplementary information: The publication is considered to only provide supplementary information that is not directly relevant to MRL setting and risk assessment. The residue levels found in linden flower would trigger the need for a honey residue study and cannot be used to directly estimate an MRL. The method used to determine the residues of glyphosate in flowers is not described in the publication and no validation data are provided.
261	Chan C-W. et al.	CA 5.9.5	2016	Successful Extracorporeal Life Support in a Case of Severe Glyphosate-Surfactant Intoxication.	Critical care medicine (2016), Vol. 44, No. 1, pp. E45	5.4.1 case b) Relevant but supplementary information: This paper looked at the use of ECMO in a critically ill patient after formulated glyphosate product overdose. ECMO is sometime of utility in treating overdose patients. This paper should not impact re-registration.
262	Chandrasekera W. U. et al.	CA 8.2.1, CP 10.2.1	2011	The lethal impacts of Roundup® (glyphosate) on the fingerlings of guppy, Poecilia reticulata Peters, 1859.	Asian Fisheries Science (2011), Vol. 24, No. 4, pp. 367	5.4.1 case b) Relevant but supplementary information: The material and methods lacks important information. The purity of the formulation is not presented. There is a narrative on water qualities / environmental conditions during the test, but there is no actual data presented to confirm the acceptability of the exposure / test conditions except for a value presented for dissolved oxygen levels. There was no analytical verification of test concentrations reported and therefore the level of exposure cannot be confirmed. The study is considered unreliable.
263	Chang E. T. et al.	CA 5.9.4	2016	Systematic review and meta-analysis of glyphosate exposure and risk of lymphohematopoietic cancers.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2016), Vol. 51, No. 6, pp. 402	5.4.1 case b) Relevant but supplementary information: The glyphosate meta-RRs took the results from the available studies at face value. The authors had no way to correct for recall bias, confounding, etc. Therefore, the meta-RRs are in error to the extent that the studies included in the meta-analysis are also in error. Chang and Delzell (2016) are clear on this point in their meta-analysis article. Accordingly glyphosate p-values and confidence intervals for the meta-RRs cannot be taken at face value because they incorporate systematic error or bias. Thus, the argument about the statistical significance/insignificance of the meta-RR for glyphosate is negated. One cannot calculate a valid p-value when there is uncontrolled systematic error (Greenland S. Randomization, statistics, and causal inference. Epidemiology 1990; 1:421-429).
264	Chau A. M. T. et al.	CA 5.9	2011	More Data on the Effect of Haemoperfusion for Acute Poisoning Is Required.	Blood Purification (2011), Vol. 31, No. 1-3, pp. 41	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Gil et al_2010, Blood Purif (2010), Vol. 30, No. 2, pp. 84-8.
265	Chen H-H. et al.	CA 5.9.5	2013	Spectrum of corrosive esophageal injury after intentional paraquat or glyphosate-surfactant herbicide ingestion.	International journal of general medicine (2013), Vol. 6, pp. 677	5.4.1 case b) Relevant but supplementary information: Ingestions of formulated glyphosate and paraquat are known to cause caustic injury which can result in respiratory and other complications. This paper should not impact the re-registration.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
266	Chiarello M. et al.	CA 6.5.3	2019	Fast analysis of glufosinate, glyphosate and its main metabolite, aminomethylphosphonic acid, in edible oils, by liquid chromatography coupled with electrospray tandem mass spectrometry.	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2019), Vol. 36, No. 9, pp. 1376	5.4.1 case b) Relevant but supplementary information: Residue analytical method. Olive oil is relevant to the uses considered for renewal in the EU. But only few real samples analysed and all showed residues < LOQ which can be predicted from the physical-chemical properties of glyphosate and AMPA.
267	Cho Y. et al.	CA 5.9.5	2019	Serial measurement of glyphosate blood concentration in a glyphosate potassium herbicide-intoxicated patient: A case report.	The American journal of emergency medicine (2019), Vol. 37, pp 160	5.4.1 case b) Relevant but supplementary information: Measurement of glyphosate blood concentration in an intoxicated patient, no unusal findings for such a case (suicide attempt).
268	Cho Y. S. et al.	CA 5.9.2	2018	The qSOFA Score: A Simple and Accurate Predictor of Outcome in Patients with Glyphosate Herbicide Poisoning.	Basic & clinical pharmacology & toxicology (2018), Vol. 123, No. 5, pp. 615	5.4.1 case b) Relevant but supplementary information: This study is describing the use of a scoring system to predict severity of outcome after patients present with a formulated glyphosate overdose. This is meant to guide clinical practice and should not impact re-registration.
269	Cho Y. S. et al.	CA 5.9.5	2019	Use of qSOFA Score in Predicting the Outcomes of Patients With Glyphosate Surfactant Herbicide Poisoning Immediately Upon Arrival at the Emergency Department.	Shock (Augusta, Ga.) (2019), Vol. 51, No. 4, pp. 447	5.4.1 case b) Relevant but supplementary information: This article describes a scoring system that is widely used in intensive care and used to determine the prognosis of patients with a variety of presenting complaints. It is descriptive and helps physicians decide wheter a patient needs early ICU intervention. This article is describing a series of overdoses and should not impact re-registration
270	Choi B. et al.	CA 5.9.5	2013	Plasma lactate level may be an insufficient monitoring tool in critically ill patient: A case of ischemia modified albumin in acute glyphosate poisoning.	Toxicology Letters (2013), Vol. 221, Supp. 1, pp. S66	5.4.1 case b) Relevant but supplementary information: This is a report about measuring IMA rather than lactate as a marker of shock after suicidal ingestion of formulated glyphosate and should not impact re-registration.
271	Claassens A. et al.	CA 8.6	2019	Soilborne glyphosate residue thresholds for wheat seedling metabolite profiles and fungal root endophyte colonisation are lower than for biomass production in a sandy soil.	Plant and Soil (2019), Vol. 438, No. 1/2, pp. 393	5.4.1 case b) Relevant but supplementary information: Presented information on effects of glyphosate on seedling emergence and soil fungi, but no specific endpoints are presented that could be used for the renewal ecotoxicological risk assessment.
272	Conti C. L. et al.	CA 5.9.4	2018	Pesticide exposure, tobacco use, poor self-perceived health and presence of chronic disease are determinants of depressive symptoms among coffee growers from Southeast Brazil	Psychiatry Research (2018), Vol. 260, pp. 187	5.4.1 case b) Relevant but supplementary information: Study is fraught with limitations including very poor statistical analysis. Outcome and exposures essentially concurrent. This publication is considered unreliable.
273	Cordova Lopez A. M. et al.	CA 8.2.4	2019	Exposure to Roundup® affects behaviour, head regeneration and reproduction of the freshwater planarian Girardia tigrina	Science of the total environment (2019), Vol. 675, pp. 453	5.4.1 case b) Relevant but supplementary information: This is an invasive flatworm species in the EU. No specific test guidelines are available for this type of study, despite the range of endpoints that appear to have been covered.
274	Correia F. V. et al.	CA 8.4.2	2010	Effects of glyphosate and 2,4-D on earthworms (Eisenia foetida) in laboratory tests.	Bulletin of environmental contamination and toxicology (2010), Vol. 85, No. 3, pp. 264	5.4.1 case b) Relevant but supplementary information: Study looks at the impact of glyphosate on earthworm reproduction. Conducted to relevant guidelines. Technical glyphosate used, Brazilian soils used. Test concentrations from 1 to 1000 mg/kg in a 56 day study. Data is useful but there is no reliable endpoint to be used in the regulatory risk assessment of glyphosate renewal.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
275	Cothran R. D. et al.	CA 8.1.4	2013	Proximity to agriculture is correlated with pesticide tolerance: evidence for the evolution of amphibian resistance to modern pesticides.	Evolutionary Applications (2013), Vol. 6, No. 5, pp. 832	5.4.1 case b) Relevant but supplementary information: Endpoints or findings are not relevant at EU level ecotox risk assessment, but may be evidence / relevant to biodiversity discussions.
276	Cremonese C. et al.	CA 5.9.4	2017	Occupational exposure to pesticides, reproductive hormone levels and sperm quality in young Brazilian men	Reproductive Toxicology (2017), Vol. 67, pp. 174	5.4.1 case b) Relevant but supplementary information: Due to exposure/outcome temporal ambiguity and failure to control for other exposures in the evaluation of specific exposures. This publication is considered unreliable.
277	da Cruz C. et al.	CA 8.2.1	2016	Sensitivity, ecotoxicity and histopathological effects on neotropical fish exposed to glyphosate alone and associated to surfactant	Journal of Environmental Chemistry and Ecotoxicology (2016), Vol. 8, No. 3, pp. 25	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP and/or according to a recognized test guideline and there are no validity criteria presented. The authors state that glyphosate alone and in association with Aterbane® BR was classified as practically non-toxic, whereas Aterbane® BR alone was considered moderately toxic for the tested organisms. However, due to insufficient explanation of experimental set-up (e.g. test substance, test medium, statistical analysis) and lack of experimental standard procedures (e.g. analytical verification), the study is may be used only as supportive information.
278	Dabney B. L. et al.	CA 8.2.6	2018	Low-dose stimulation of growth of the harmful alga, Prymnesium parvum, by glyphosate and glyphosate-based herbicides.	Harmful algae (2018), Vol. 80, pp. 130	5.4.1 case b) Relevant but supplementary information: This paper does not present endpoints that can be used in the ecotox risk assessment for the renewal. The information are however considered supportive to discussions over hormesis.
279	Dai P. et al.	CA 8.3.1, CP 10.3.1	2018	The Herbicide Glyphosate Negatively Affects Midgut Bacterial Communities and Survival of Honey Bee during Larvae Reared in Vitro.	Journal of agricultural and food chemistry (2018), Vol. 66, No. 29, pp. 7786	5.4.1 case b) Relevant but supplementary information: The bacterial communities in the mid-gut of bees were characterised. No gut bacterial analysis was conducted on the positive control bees. Overall an increase in abundance and richness of bacterial taxa was observed at the highest exposure concentration. The implications of this was not discussed in the paper. Bacterial assemblages in the gut of honey bees is not relatable to an EU level ecotoxicology risk assessment. The study is adequately described including specifications of the test item and test design. However, no regulatory endpoints were derived and there is no analytical verification of dose solutions.
280	Damgaard C. et al.	CA 8.7	2014	The effect of glyphosate on the growth and competitive effect of perennial grass species in semi-natural grasslands.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2014), Vol. 49, No. 12, pp. 897	5.4.1 case b) Relevant but supplementary information: Not directly relevant to Ecotox risk assessment, but maybe used in biodiversity discussion.
281	Dang Q. et al.	CA 5.9.1	2011	Control Effect of Occupational Hazards in Construction Project of Glyphosate Production	Chinese Journal of Public Health Engineering (2011), Vol. 10, no. 2, pp. 111	5.4.1 case b) Relevant but supplementary information: This is a paper describing the evaluation of a glyphosate production facility and a description of how to mitigate risks of exposure to the chemistries involved in glyphosate production.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
282	de Almeida L. L. et al.	CA 5.6	2017	Effects of melatonin in rats in the initial third stage of pregnancy exposed to sub-lethal doses of herbicides.	Acta histochemica (2017), Vol. 119, No. 3, pp. 220	5.4.1 case b) Relevant but supplementary information: Formulation tested at high doses of 500 mg/kg bw/day (Roundup), therefore supplementary only.
283	de Araujo J. S A. et al.	CA 5.9.4	2016	Glyphosate and adverse pregnancy outcomes, a systematic review of observational studies.	BMC public health (2016), Vol. 16, pp. 472	5.4.1 case b) Relevant but supplementary information: review, secondary source.
284	de Avila R. I. et al.	CA 5.8	2017	In vitro assessment of skin sensitization, photosensitization and phototoxicity potential of commercial glyphosate-containing formulations.	Toxicology in vitro (2017), Vol. 45, No. 3, pp. 386	5.4.1 case b) Relevant but supplementary information: Non-validated model confirms glyphosate non-sensitized & non-photosensitizer. Formulation data inconsistent in non-validated model.
285	de Campos Oliveira R. et al.	CA 8.2.7	2016	Assessment of the potential toxicity of glyphosate-based herbicides on the photosynthesis of Nitella microcarpa var. wrightii (Charophyceae)	Phycologia (2016), Vol. 55, no. 5, pp. 577	5.4.1 case b) Relevant but supplementary information: Despite the study using a recognised OECD guideline, the endpoints in terms of respiration rates are not relevant to an EU level risk assessment for Annex I renewal, which specifically considers inhibition of glyphosate growth rates. The study considers technical glyphosate, Roundup and AMPA. Despite the techical material being identified, the formulation was not. It is not possible to conclude on the effects caused by the formulation as it was inferred that the product contains POEA.
286	de Castilhos Ghisi N. et al.	CA 5.4	2016	Does exposure to glyphosate lead to an increase in the micronuclei frequency? A systematic and meta-analytic review.	Chemosphere (2016), Vol. 145, pp. 42	5.4.1 case b) Relevant but supplementary information: No new data presented, only compilation of pooled glyphosate and formulated product meta-analyses.
287	De Geronimo E. et al.	CA 7.1.3.1.1	2018	Glyphosate sorption to soils of Argentina. Estimation of affinity coefficient by pedotransfer function	Geoderma (2018), Vol. 322, pp. 140	5.4.1 case b) Relevant but supplementary information: Reports most important parameters for glyphosate adsorption. Provides equation to predict Freundlich constant Kf. Useful qualitative information but not directly relevant for risk assessment.
288	de Jesus Veloso Castro A. et al.	CA 8.2.7	2015	Using a toxicity test with Ruppia maritima (Linnaeus) to assess the effects of Roundup.	Marine pollution bulletin (2015), Vol. 91, No. 2, pp. 506	5.4.1 case b) Relevant but supplementary information: This paper presents information on the effects of glyphosate on a saline tolerant species. However, there is no glyphosate exposure presented in the paper so it is very difficult to relate the observed effects to an exposure event / agricultural application.
289	De Raadt W. M. et al.	CA 5.9.5	2015	Acute eosinophilic pneumonia associated with glyphosate-surfactant exposure.	Sarcoidosis, vasculitis, and diffuse lung diseases : official journal of WASOG (2015), Vol. 32, No. 2, pp. 172	5.4.1 case b) Relevant but supplementary information: This article is a case report of a smoker who developed eosinophilic pneumonia after glyphosate exposure. Glyphosate is not a sensitizer as established by multiple GLP regulatory studies. Nozzle application of formulated glyphosate producess aerosols of between 200-350 microns. In humans, it takes droplets of <100 microns to cause inhalational injury. The claim that formulated glyphosate can cause inhalational injury in a setting where it isn't aspirated is not biologically plausible.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
290	Dechartres J. et al.	CA 5.8.2	2019	Glyphosate and glyphosate-based herbicide exposure during the peripartum period affects maternal brain plasticity, maternal behaviour and microbiome	Journal of Neuroendocrinology (2019), Vol. 31, pp. e12731	5.4.1 case b) Relevant but supplementary information: The glyphosate used was not sufficiently characterised, only one dose level was tested, the number of animals used per dose level was too low (n = 7) and a unreliable technique for oral dosing was employed (injection of test item in cookies). This publication is considered unreliable.
291	Dedeke G. A. et al.	CA 5.8.2	2018	Comparative Assessment on Mechanism Underlying Renal Toxicity of Commercial Formulation of Roundup Herbicide and Glyphosate Alone in Male Albino Rat.	International Journal of Toxicology (2018), Vol. 37, No. 4, pp. 285	5.4.1 case b) Relevant but supplementary information: The glyphosate used was not sufficiently characterized, the number of animals used per dose level was too low, and the conduct of the biochemical tests and the analysis of glyphosate in kidney tissue was poorly described. Moreover, the results from the testing of the oxidative stress parameters seem not reliable. This publication is considered unreliable.
292	Deepananda K. H. M. A. et al.	CA 8.2.4, CP 10.2.2	2011	Acute toxicity of a glyphosate herbicide, Roundup (R), to two freshwater crustaceans.	Journal of the National Science Foundation of Sri Lanka (2011), Vol. 39, No. 2, pp. 169	5.4.1 case b) Relevant but supplementary information: After exposure to Roundup® the 48 hour acute LC50 for adult copepod Phyllodiaptomus annae was determined to be 1.059 mg/L. This endpoint is questionable as there was only 19% mortality at the highest exposure concentration in the test (1.6 mg/L). For the second species, the 72 and 96 hour LC50 for decapod shrimp Caridina nilotica was determined to be 107.53 and 60.97 mg/L, respectively. However, the mean percenatge mortality at both timepoints was identical from Table 1 in the paper. As there are no biological data presented in the paper, the observed mortality and the LC50 calculation cannot be confirmed. The formulation content is identified as Roundup® (360g/L, 98%). However, the presented purity appears to be incorrectly stated, as a formulation with 98% purity, would suggest a technical material has been used, so there is uncertainty in actually what has been tested in the study. The tests were conducted according to EPA Guideline "Methods of Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms". However, the origin of the organisms is not given. Therefore, previous exposure the test species may have had to pesticides or other chemicals is unclear. Furthermore, there was no analytical verification of test concentrations reported and the study is non-GLP, thus the reliability of the endpoint is questionable. Given the uncertainty in what was actually tested, the calculated endpoints and the conduct of the test, the study is considered unreliable.
293	Defarge N. et al.	CA 5.6	2012	Letter to the Editor: Developmental and reproductive outcomes of Roundup and Glyphosate in humans and animals.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 7, pp. 433	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, reaction on Williams et al._2012, Toxicol. Environ. Health B Crit. Rev. 15(1):39-96.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
294	Defarge N. et al.	CA 5.8	2016	Co-Formulants in Glyphosate-Based Herbicides Disrupt Aromatase Activity in Human Cells below Toxic Levels.	International journal of environmental research and public health (2016), Vol. 13, No. 3, pp. 264	5.4.1 case b) Relevant but supplementary information: In vitro results not significant for glyphosate vs multiple formulations or mixtures.
295	Demetrio P. M. et al.	CA 8.2.4	2012	Effects of pesticide formulations and active ingredients on the coelenterate Hydra attenuata (Pallas, 1766).	Bulletin of environmental contamination and toxicology (2012), Vol. 88, No. 1, pp. 15	5.4.1 case b) Relevant but supplementary information: Endpoints for Hydra attenuata are not a data requirement for the renewal data requirements under 1107/2009.
296	Demetrio P. M. et al.	CA 8.2.4.1, CP 10.2.1	2014	The effect of cypermethrin, chlorpyrifos, and glyphosate active ingredients and formulations on Daphnia magna (Straus).	Bulletin of environmental contamination and toxicology (2014), Vol. 93, No. 3, pp. 268	5.4.1 case b) Relevant but supplementary information: The test was not performed according to a relevant guideline. Although procedures are well documented, the water qualities during testing are not reported (only stock culture holding conditions are reported) and the test design in the study is not described, such as the number of animals exposed, test media preparation details and acclimation period prior to exposure. There are no biological data presented in order to confirm the achieved endpoints. The glyphosate formulation used in the testing is not the representative formulation for the renewal. Apparent from the endpoints achieved for the technical material and for the formulation, is the increased sensitivity of daphnia to the formulation, which is considered attributable to the co-formulants in the formulation and not to glyphosate. Based on the uncertainty associated with the materials and methods as described above, the study is considered as supplementary only.
297	Dennis P. G. et al.	CA 8.9	2018	The effects of glyphosate, glufosinate, paraquat and paraquat-diquat on soil microbial activity and bacterial, archaeal and nematode diversity	Scientific Reports (2018), Vol. 8, pp. 1	5.4.1 case b) Relevant but supplementary information: Nematode abundance is not an endpoint used in Ecotox risk assessment. However, these data are considered relevant to soil community effects based on single applications. Article is considered supplementary, as the approach used is not a recognised approach for ecotox risk assessment.
298	Deo S. P. et al.	CA 5.9.5	2012	Accidental chemical burns of oral mucosa by herbicide.	Journal of the Nepal Medical Association (2012), Vol. 52, No. 185, pp. 40	5.4.1 case b) Relevant but supplementary information: Large ingestions of formulated glyphosate can often result in caustic injury secondary to the surfactant's detergent actions on the mucous membranes of in people who ingest them. That said, they shouldn't cause microstomia, which tends to result from much more corrosive and scarring chemicals. This should not impact re-registration.
299	DeSesso J. M. et al.	CA 5.6	2012	Letter to the Editor: Toxicity of Roundup and Glyphosate response.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 4, pp. 236	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, response on Belle_2012, Journal of Toxicology and Environmental Health Part B Critical Reviews, (2012) Vol. 15, No. 4, pp. 233-235.
300	DeSesso J. M. et al.	CA 5.6	2012	Comment on "Glyphosate impairs male offspring reproductive development by disrupting gonadotropin expression".	Archives of Toxicology (2012), Vol. 86, No. 11, pp. 1791	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Romano et al._2012, Arch Toxicol (2012), Vol. 86, No. 4, pp. 663-73.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
301	DeSesso J. M. et al.	CA 5.6	2012	Response to the comments of Defarge and colleagues.	Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 7, pp. 438	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, reaction on Defarge et al._2012_Journal of Toxicology and Environmental Health Part B Critical Reviews (2012), Vol. 15, No. 7, pp. 433-437.
302	di Guardo A. et al.	CA 7.5	2016	A case study on monitoring glyphosate in water. Monitoraggio delle acque: il caso studio glifosate.	Informatore Agrario (2016), Vol. 72, No. 23, pp. 55	5.4.1 case b) Relevant but supplementary information: No new data presented. Describes a method for evaluating areas around monitoring stations in Lombardi region of Italy where the concentrations of glyphosate exceed the drinking water standard.
303	Dollinger J. et al.	CA 7.1.3.1.1	2016	Variability of glyphosate and diuron sorption capacities of ditch beds determined using new indicator-based methods.	The Science of the total environment (2016), Vol. 573, pp. 716	5.4.1 case b) Relevant but supplementary information: Supplementary information of glyphosate sorption. Sorption properties of glyphosate to the ditch-bed materials
304	Dollinger J. et al.	CA 7.1.3.1.1	2017	Using fluorescent dyes as proxies to study herbicide removal by sorption in buffer zones.	Environmental science and pollution research international (2017), Vol. 24, No. 12, pp. 11752	5.4.1 case b) Relevant but supplementary information: Soil adsoption data for glyphosate are reported but they are well within the numbers reported in the dossier. Adsorption compared to that of sulforhodamine B flourescent dye.
305	Dominguez A. et al.	CA 8.4.1	2016	Toxicity of AMPA to the earthworm Eisenia andrei Bouche, 1972 in tropical artificial soil.	Scientific reports (2016), Vol. 6, pp. 19731	5.4.1 case b) Relevant but supplementary information: The study is well-documented and performed according to ISO guideline 11268-1 and 11268-2. However, the artificial soil used is not classed as representative in the EU. Soil characteristics are only partly given as information on CEC, organic carbon content and bulk density are missing. Additionally, one of the validity criteria for the chronic test was not met (the reported minimum number of control juveniles is too low). Endpoints (NOEC, LC50) were not derived and therefore this study delivers only supplementary information.
306	Drasar P. et al.	CA 5.8.3	2018	Glyphosate, an important endocrine disruptor Glyfosat - Dulezity endokrinni disruptor.	Diabetologie Metabolismus Endokrinologie Vyziva (2018), Vol. 21, No. 2, pp. 93	5.4.1 case b) Relevant but supplementary information: review, secondary source.
307	Druart C. et al.	CA 8.2.1	2017	A full life-cycle bioassay with Cantareus aspersus shows reproductive effects of a glyphosate-based herbicide suggesting potential endocrine disruption.	Environmental pollution (2017), Vol. 226, pp. 240	5.4.1 case b) Relevant but supplementary information: The test design is novel and the achieved endpoints cannot be used in an EU ecotox risk assessment for Annex I renewal.
308	Druart C. et al.	CA 8.4.2	2010	Towards the development of an embryotoxicity bioassay with terrestrial snails: screening approach for cadmium and pesticides.	Journal of hazardous materials (2010), Vol. 184, No. 1-3, pp. 26	5.4.1 case b) Relevant but supplementary information: Glyphosate a.i., glyphosate products and other products used to compare toxicity to land snails. LC50 generated. But new method descibed not to any established guideline.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
309	Druart C. et al.	CA 8.7	2011	Glyphosate and glufosinate-based herbicides: fate in soil, transfer to, and effects on land snails	Journal of soils and sediments (2011), Vol. 11, No. 8, pp. 1373	5.4.1 case b) Relevant but supplementary information: The material and methods part lack some important information. The test design for the exposure of snails to treated food is not specified and thus the intake dose per snail is unclear. Furthermore, the application of the test solutions into the soil is not reported and an even distribution cannot be confirmed. Nevertheless a chemical analysis of the soil during exposure was performed. As the biological data does not report results as an endpoint useful for the risk assessment, the study is not done to a guideline and is non-GLP and can be considered as supplementary only.
310	Dung Le Tien et al.	CA 5.5	2013	Comments on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 428	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
311	Ehling S. et al.	CA 6.9	2015	Analysis of Glyphosate and Aminomethylphosphonic Acid in Nutritional Ingredients and Milk by Derivatization with Fluorenylmethyloxycarbonyl Chloride and Liquid Chromatography-Mass Spectrometry.	Journal of agricultural and food chemistry (2015), Vol. 63, No. 48, pp. 10562	5.4.1 case b) Relevant but supplementary information: Selected analysis of samples that provide confirmatory results.
312	Elsner P. et al.	CA 5.9.2	2018	Occupational koebnerization of psoriasis caused by glyphosate.	Journal der Deutschen Dermatologischen Gesellschaft = Journal of the German Society of Dermatology (2018), Vol. 16, No. 1, pp. 70	5.4.1 case b) Relevant but supplementary information: There is not a mechanism for glyphosate to cause psoriasis, particularly 1 week post exposure.
313	Emmanuel L. D. A. et al.	CA 8.7	2015	Effect of glyphosate on Bacillus megaterium with reference to tea ecosystem.	International Journal of Tea Science (2015), Vol. 11, No. 3/4, pp. 16	5.4.1 case b) Relevant but supplementary information: Endpoints are not releateable to an EU ecotox risk assessment, but may inform on discussions over community level effects in soil.
314	Eriguchi M. et al.	CA 5.9.2	2019	Parkinsonism Relating to Intoxication with Glyphosate.	Internal medicine (2019), Vol. 58, No. 13, pp. 1935	5.4.1 case b) Relevant but supplementary information: (Reversible) Parkinsonism in case of acute in-toxication is a well-known effect and not specific for glyphosate.
315	Exterkoetter R. et al.	CA 7.1.4	2019	Potential of terracing to reduce glyphosate and AMPA surface runoff on Latosol	Journal of soils and sediments (2019), Vol. 19, No. 5, pp. 2240	5.4.1 case b) Relevant but supplementary information: Study in Brazil. Demonstrates effectiveness of terrace in reducing total mass loss of glyphosate and AMPA by reducing run-off volume. Did not reduce concentrations of glyphosate in run-off water. Potentially useful information but not directly relevant to EU risk assessment.
316	Fagundez G. A. et al.	CA 8.3.1	2016	Do agrochemicals used during soybean flowering affect the visits of Apis mellifera L.?	Spanish Journal of Agricultural Research (2016), Vol. 14, No. 1, p. e0301	5.4.1 case b) Relevant but supplementary information: Field level investigation where soybean are sprayed with glyphosate and the behaviour of bees is assessed. Findings not directly relateable to EU level risk assessment, as OTT crop application not on GAP - the observed effects are potentially useful for the discussion on indirect effects .

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
317	Farkas E. et al.	CA 5.8	2018	Label-free optical biosensor for real-time monitoring the cytotoxicity of xenobiotics: A proof of principle study on glyphosate.	Journal of hazardous materials (2018), Vol. 351, pp. 80	5.4.1 case b) Relevant but supplementary information: in vitro cytotoxicity assays.
318	Feldman V.	CA 5.7	2014	Neurodevelopmental toxicity: Still more questions than answers.	The Lancet Neurology (2014), Vol. 13, No. 7, pp. 645	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Grandjean et al_2014, Lancet Neurol. 2014 Jul;13(7):648-9.
319	Filizadeh Y. et al.	CA 8.2	2011	Toxicity determination of three sturgeon species exposed to glyphosate.	Iranian Journal of Fisheries Sciences (2011), Vol. 10, No. 3, pp. 383	5.4.1 case b) Relevant but supplementary information: LC50 generated for sturgeon species. Glyphosate products used. Guideline not mentioned but suitable methods described. Conducted in Iran.
320	Fluegge K. et al.	CA 5.9.4	2018	Environmental factors influencing the link between childhood ADHD and risk of adult coronary artery disease.	Medical Hypotheses (2018), Vol. 110, pp. 83	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.
321	Fluegge K. et al.	CA 5.9.4	2016	Glyphosate Use Predicts Healthcare Utilization for ADHD in the Healthcare Cost and Utilization Project net (HCUPnet): A Two-Way Fixed-Effects Analysis.	Polish Journal of Environmental Studies (2016), Vol. 25, No. 4, pp. 1489	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.
322	Fortes C. et al.	CA 5.9.4	2016	Occupational Exposure to Pesticides With Occupational Sun Exposure Increases the Risk for Cutaneous Melanoma	Journal of occupational and environmental medicine (2016), Vol. 58, No. 4, pp. 370	5.4.1 case b) Relevant but supplementary information: No specific analyses for glyphosate. Interviewers were not blinded. Recall bias may produce spurious positive associations. Confounding not addressed adequately. This publication is considered unreliable.
323	Frappart M. et al.	CA 5.9.2	2011	A fatal acute poisoning with glyphosate: importance of gastrointestinal toxicity. Original title: Une intoxication aigue fatale au glyphosate : importance de la toxicite digestive.	Annales francaises d'anesthesie et de reanimation (2011), Vol. 30, No. 11, pp. 852	5.4.1 case b) Relevant but supplementary information: This case report describes caustic injury to the GI tract and multi-organ failure after formulated glyphosate overdose. The clinical course is consistent with previous reports of overdose and should not impact re-registration.
324	Fuentes L. et al.	CA 8.1.4	2014	Role of sediments in modifying the toxicity of two Roundup formulations to six species of larval anurans.	Environmental toxicology and chemistry (2014), Vol. 33, No. 11, pp. 2616	5.4.1 case b) Relevant but supplementary information: No specific endpoints presented that could be used in an EU level Annex I Ecotox risk assessment.
325	Garcia-Torres T. et al.	CA 8.4.2	2014	Exposure assessment to glyphosate of two species of annelids.	Bulletin of environmental contamination and toxicology (2014), Vol. 93, No. 2, pp. 209	5.4.1 case b) Relevant but supplementary information: Information may be used to support the lack of effects in earthworm studies.
326	Garlich F. M. et al.	CA 5.9.5	2014	Hemodialysis clearance of glyphosate following a life-threatening ingestion of glyphosate-surfactant herbicide.	Clinical toxicology (2014), Vol. 52, No. 1, pp. 66	5.4.1 case b) Relevant but supplementary information: This article discusses the sucessful use of haemodialysis in a patient who was critically ill after a forrmulated glyphosate overdose.
327	Gaur H. et al.	CA 8.2.1	2019	Glyphosate induces toxicity and modulates calcium and NO signaling in zebrafish embryos.	Biochemical and biophysical research communications (2019 Vol. 513, No. 4, pp. 1070	5.4.1 case b) Relevant but supplementary information: Considered supplementary as the approaches used are not used in Ecotox risk assessment for Annex I renewal.
328	Gencer N. et al.	CA 5.8.2	2012	In vitro effects of some herbicides and fungicides on human erythrocyte carbonic anhydrase activity	Fresenius Environmental Bulletin (2012), Vol. 21, No. 3, pp. 549	5.4.1 case b) Relevant but supplementary information: Glyphosate tested was not sufficiently characterised, the conditions of the inhibition assay are incompletely reported, no positive control was used and the statistics arenot well reported. This publication is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
329	Geng C. et al.	CA 7.1.3.1.1	2015	Modeling the release of organic contaminants during compost decomposition in soil.	Chemosphere (2015), Vol. 119, pp. 423	5.4.1 case b) Relevant but supplementary information: The paper is about degradation and adsorption of glyphosate on compost and soils and the data is consistent with endpoints reported in the dosier it does not change the risk assessment.
330	Ghafoor A. et al.	CA 7.1.3.1.1	2013	Modelling pesticide sorption in the surface and subsurface soils of an agricultural catchment.	Pest management science (2013), Vol. 69, No. 8, pp. 919	5.4.1 case b) Relevant but supplementary information: Sorption of glyphosate was measured in surface and subsurface soils to test an 'extended' partitioning model that also accounts for inorganic sorbents and pH as well as organic sorbents.
331	Gil H-W. et al.	CA 5.9.5	2013	Effect of intravenous lipid emulsion in patients with acute glyphosate intoxication.	Clinical toxicology (2013), Vol. 51, No. 8, pp. 767	5.4.1 case b) Relevant but supplementary information: This paper evaluated the use of lipid therapy to treat formulated glyphosate overdoses. The mortality in these overdoses is usually due to the caustic injury to the mucosa membrane from the surfactant moeity of the product. There is some evidence that lipid emulsion can decrease the toxicity of the surfactant. These are suicidal ingestions and should not impact re-registration.
332	Goldner W. S. et al.	CA 5.9.4	2013	Hypothyroidism and Pesticide Use Among Male Private Pesticide Applicators in the Agricultural Health Study	Journal of Occupational and Environmental Medicine (2013), Vol. 55, No. 10, pp. 1171	5.4.1 case b) Relevant but supplementary information: No correlation between effects and glyphosate use.
333	Goldstein D. A. et al.	CA 5.7	2014	Neurodevelopmental toxicity: Still more questions than answers.	The Lancet Neurology (2014), Vol. 13, No. 7, pp. 645	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Grandjean et al._2014, Lancet Neurol (2014), Vol. 13, No. 7, pp. 648-9.
334	Goldstein D. A. et al.	CA 5.9.1	2012	Comment: Aris and Leblanc "Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Townships of Quebec, Canada".	Reproductive Toxicology (2012), Vol. 33, No. 1, pp. 120	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, comments on Aris et al._2011, Reprod. Toxicol (2011), Vol. 31, pp. 528-533.
335	Goldstein D. A. et al.	CA 5.9.2	2018	Reversible Parkinsonism following glyphosate exposure.	Parkinsonism and Related Disorders (2018), Vol. 56, pp. 107	5.4.1 case b) Relevant but supplementary information: Letter ref to Zheng et al._2018, Parkinsonism Relat Disord. (2018), Vol. 56, pp.108.
336	Grandcoin A. et al.	CA 7.1.2.1.2, CA 7.1.3.1.2, CA 7.2.1.3	2017	AminoMethylPhosphonic acid (AMPA) in natural waters: Its sources, behavior and environmental fate.	Water research (2017), Vol. 117, pp. 187	5.4.1 case b) Relevant but supplementary information: Review paper, paper does not report experimental results but it is a comprehensive review on the sources of AMPA in the environment.
337	Grandjean P. et al.	CA 5.7	2014	Neurodevelopmental toxicity: Still more questions than answers - Authors' response.	The Lancet Neurology (2014), Vol. 13, No. 7, pp. 648	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, author responding to multiple Letters to Editors
338	Greim H. et al.	CA 5.5	2015	Evaluation of carcinogenic potential of the herbicide glyphosate, drawing on tumor incidence data from fourteen chronic/carcinogenicity rodent studies.	Critical reviews in toxicology (2015), Vol. 45, No. 3, pp. 185	5.4.1 case b) Relevant but supplementary information: review, secondary source.
339	Gress S. et al.	CA 5.8	2015	Glyphosate-based herbicides potently affect cardiovascular system in mammals: review of the literature.	Cardiovascular toxicology (2015), Vol. 15, No. 2, pp. 117	5.4.1 case b) Relevant but supplementary information: review, secondary source.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
340	Gros P. et al.	CA 7.1.3.1.1	2017	Glyphosate binding in soil as revealed by sorption experiments and quantum-chemical modeling.	The Science of the total environment (2017), Vol. 586, pp. 527	5.4.1 case b) Relevant but supplementary information: A multitude of binding mechanisms to clay minerals and organic colloids studied make the occurrence of free glyphosate rather unlikely but a leaching of glyphosate complexes via preferential flow path through soil and transfer to waterways rather likely.
341	Grunewald W. et al.	CA 5.5	2013	Comment on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 447	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol. (2012), retracted
342	Gui Y-X. et al.	CA 5.8	2012	Glyphosate induced cell death through apoptotic and autophagic mechanisms.	Neurotoxicology and teratology (2012), Vol. 34, No. 3, pp. 344	5.4.1 case b) Relevant but supplementary information: Unrealistically high in vitro dosing in the mM range.
343	Gungordu A.	CA 8.1.4	2013	Comparative toxicity of methidathion and glyphosate on early life stages of three amphibian species: Pelophylax ridibundus, Pseudepidalea viridis, and Xenopus laevis.	Aquatic toxicology (2013), Vol. 140-141, pp. 220	5.4.1 case b) Relevant but supplementary information: Endpoints for amphibians are not a data requirement for Annex I renewal in the EU, as there are no recognised guidelines.
344	Gungordu A. et al.	CA 8.1.4	2016	Integrated assessment of biochemical markers in premetamorphic tadpoles of three amphibian species exposed to glyphosate- and methidathion-based pesticides in single and combination forms.	Chemosphere (2016), Vol. 144, pp. 2024	5.4.1 case b) Relevant but supplementary information: Amphibian enzyme level based endpoints are not a data requirement for the EU level ecotox risk assessment for Annex I purposes. Endpoints cannot be directly related to the EU level Ecotox risk assessment.
345	Hackenberger Davorka K. et al.	CA 8.4.1	2018	Acute and subchronic effects of three herbicides on biomarkers and reproduction in earthworm Dendrobaena veneta.	Chemosphere (2018), Vol. 208, pp. 722	5.4.1 case b) Relevant but supplementary information: The chronic test was performed according to OECD 222. However, the study was not conducted to GLP. Information on validity criteria are missing, and there is not analytical verification of soil concentrations. The unexpectedly high number of cocoons and the low number of juveniles being produced in the control group at the end of the study suggests that the quality of the earthworms going into the study may have been low. According to OECD 222, by the end of the test, the number of juveniles produced per adult worm should be > 30. In this case, with six adult worms per replicate there was a mean production (juveniles per worm) of 2.67 worms per adult. It is also understood that the OECD 222 test guideline uses a different species (Eisenia fetida) and not Dendrobaena veneta. It is relevant to consider juvenile production in the control as a check on the test system robustness. This cannot be confirmed in this case. Therefore, the study can be considered acceptable as supplementary information.
346	Haggard D. E. et al.	CA 5.8.3	2018	Erratum to High-Throughput H295R Steroidogenesis Assay: Utility as an Alternative and a Statistical Approach to Characterize Effects on Steroidogenesis.	Toxicological Sciences (2018), Vol. 164, No. 2, pp. 646	5.4.1 case b) Relevant but supplementary information: Erratum to Haggard et al._2018, Toxicological Sciences (2018), Vol. 162, No. 2, pp. 509-534.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
347	Haggard D. E. et al.	CA 5.8.3	2018	High-throughput H295R steroidogenesis assay: utility as an alternative and a statistical approach to characterize effects on steroidogenesis	Toxicological Sciences (2018), Vol. 162, No. 2, pp. 509	5.4.1 case b) Relevant but supplementary information: ToxCast data for high throughput H295R assay not available on glyphosate, presumably because it is not soluble in DMSO.
348	Hagner M. et al.	CA 7.1.4.1.1	2013	The effects of biochar, wood vinegar and plants on glyphosate leaching and degradation	European journal of soil biology (2013), Vol. 58, pp. 1	5.4.1 case b) Relevant but supplementary information: The paper investigated addition of biochar, plants, and wood vinegar to the soil in pots and reported that biochar decreased the leaching of glyphosate, it is only relevant for mechanism of sorption but not for risk assessment.
349	Hammond B. et al.	CA 5.5	2013	A Comment on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 444	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
350	Han S. K. et al.	CA 5.9	2010	Use of a lipid emulsion in a patient with refractory hypotension caused by glyphosate-surfactant herbicide.	Clinical toxicology (2010), Vol. 48, No. 6, pp. 566	5.4.1 case b) Relevant but supplementary information: This is a case report of a suicidal ingestion of formulated glyphosate that was treated with lipid emulsion and symptoms improved. As this is a description of medical management of a suicidal overdose, this should not impact re-registration
351	Hansen L. R. et al.	CA 8.2.4	2016	Behavioral responses of juvenile Daphnia magna after exposure to glyphosate and glyphosate-copper complexes.	Aquatic toxicology (2016), Vol. 179, pp. 36	5.4.1 case b) Relevant but supplementary information: Paper considers the influence of metals in daphnia testing and their influence on toxicity. Soils on the toxicity of endpoints considering speciation and enhanced toxicity in the presence of metals are not used in the EU level ecotox risk assessment.
352	Hansen N. B. et al.	CA 5.9.5	2013	Severe toxicity from accidental glyphosate ingestion in a child.	Clinical Toxicology (2013), Vol. 51, No. 4, pp. 354	5.4.1 case b) Relevant but supplementary information: This is a case report of an accidental ingestion of formulated glyphosate resulting in mild corrosive injury to the GI tract in a small child and should not impact re-registration.
353	Heinemann J. A.	CA 5.5	2013	Food and chemical toxicology.	Food and Chemical Toxicology (2013), Vol. 53, pp. 442	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
354	Helander M. et al.	CA 8.6	2019	Glyphosate residues in soil affect crop plant germination and growth.	Scientific reports (2019), Vol. 9, No. 1, pp. 19653	5.4.1 case b) Relevant but supplementary information: The study presents endpoints that may be considered relevant to a risk assessment, however, the test design does not reflect the seedling emergence study required as part of the data requirements.
355	Henneberger P. K. et al.	CA 5.9.4	2014	Exacerbation of symptoms in agricultural pesticide applicators with asthma.	International archives of occupational and environmental health (2014), Vol. 87, No. 4, pp. 423	5.4.1 case b) Relevant but supplementary information: No adverse effects correlating with glyphosate use.
356	Honskii Y. I. et al.	CA 5.8.2	2011	Effects of heavy metal salts and organophosphoric pesticides on protein metabolism in exposed white rats	Medichna Khimiya (2011), Vol. 13, No. 4, pp. 100	5.4.1 case b) Relevant but supplementary information: Mechanistic study without clear relevance for the risk assessment / glyphosate.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
357	Hopa E. et al.	CA 5.1	2011	The inhibitory effects of some pesticides on human erythrocyte glucose-6-phosphate dehydrogenase activity (in vitro).	Fresenius Environmental Bulletin (2011), Vol. 20, No. 5a, pp. 1314	5.4.1 case b) Relevant but supplementary information: glyphosate and 2,4-D had been used as test material from a "local pesticide shop". No further identification of the test material had been provided, moreover the study design is not well described.
358	Hoppin J. A. et al.	CA 5.9.4	2017	Pesticides are Associated with Allergic and Non-Allergic Wheeze among Male Farmers.	Environmental health perspectives (2017), Vol. 125, No. 4, pp. 535	5.4.1 case b) Relevant but supplementary information: The exposure and outcome data were concurrent, so a temporal relationship could not be established. The extraordinary number of positive statistically significant findings mitigates against interpreting any one finding as likely to be causal. This publication is considered unreliable.
359	Hour B. T. et al.	CA 5.9.5	2012	Herbicide roundup intoxication: successful treatment with continuous renal replacement therapy.	The American journal of medicine (2012), Vol. 125, No. 8, pp. 1	5.4.1 case b) Relevant but supplementary information: This article discusses the use of CVVD in formulated glyphosate overdoses and medical management of suicidal ingestions and therefore should not impact registration decisions
360	Indirakshi J. et al.	CA 5.9.5	2017	Toxic Epidermal Necrolysis and Acute Kidney Injury due to Glyphosate Ingestion.	Indian journal of critical care medicine (2017), Vol. 21, No. 3, pp. 167	5.4.1 case b) Relevant but supplementary information: Glyphosate based formulations are not known to cause TEN which is a t-cell mediated type IV hypersensitivity reaction. >1% of glyphosate is absorbed through the skin and large ingestions have caustic effects on th GI tract which can result in mult-iorgan failure.
361	Isaac A. O. et al.	CA 8.2.1	2017	Behavioural and some physiological assessment of glyphosate and paraquat toxicity to juveniles of African catfish, Clarias gariepinus.	Pakistan Journal of Zoology (2017), Vol. 49, No. 1, pp. 183	5.4.1 case b) Relevant but supplementary information: Although the study itself is not directly relatable to an EU level ecotoxicological risk assessment for Annex I renewal purposes, the study was potentially considered as sublethal effects on fish behaviour following exposure to glyphosate were described.
362	Issa A. A. E. et al.	CA 8.2.6	2013	Alterations in some metabolic activities of Scenedesmus quadricauda and Merismopedia glauca in response to glyphosate herbicide.	Journal of Biology and Earth Sciences (2013), Vol. 3, No. 1, pp. B17	5.4.1 case b) Relevant but supplementary information: The reported endpoints in terms of growth rates and pigment levels are not relateable to the EU level risk assessment for the renewal. The idenitity of the test items cannot be confirmed.
363	Iwai K. et al.	CA 5.9.5	2014	Utility of upper gastrointestinal endoscopy for management of patients with roundup poisoning.	Journal of Clinical Toxicology (2014), Vol. 4, No. 6, pp. 1	5.4.1 case b) Relevant but supplementary information: This article discusses the use of endoscopy to treat formulated glyphosate overdose and medical management of suicidal ingestions and therefore should not impact registration decisions.
364	Jacques M. T. et al.	CA 8.7	2019	Reprotoxicity of glyphosate-based formulation in Caenorhabditis elegans is not due to the active ingredient only.	Environmental pollution (2019), Vol. 252, No. Pt B, pp. 1854	5.4.1 case b) Relevant but supplementary information: The toxicity of glyphosate (glyphosate in monoisopropylamine salt) and its commercial formulation Termifin - Dexter Latina to the nematode Caenorhabditis elegans was investigated. Reproductive capacity was evaluated by means of brood size. The material and methods section lack some important information. The preparation of the test solutions and application of the test item are not described. Test concentrations, controls and loading per replicate are not specified and therefore not verifiable. Description of exposure throughout the study is also missing. The formulation used is not the representative formulation for the renewal. Furthermore, no useful endpoint for the regulatory risk assessment of terrestrial organisms can be derived.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
365	Jain S. et al.	CA 8.6.2	2012	Herbicidal action on germination, amylase activity and gibberellin level in Cajanus cajan (L.).	Bioscience Discovery Journal (2012), Vol. 3, No. 2, pp. 232	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP and the test substance source and identity could not be verified. The study has not been conducted according to a recognized test guideline and there are no validity criteria presented. The authors state that glyphosate affects the level of gibberellin and amylase activity, as well as causing the food reserve content of seedlings to decrease gradually with increase in concentration. However, given the lack of standard guidelines, unclear experimental design and approach, test substance and dose rates not sufficiently being reported as well as challenges in interpreting the study results, make reaching any reliable conclusions from the study quite challenging.
366	Jansons M. et al.	CA 6.9	2018	Occurrence of glyphosate in beer from the Latvian market.	Food additives & contaminants. Part A, Chemistry, analysis, control, exposure & risk assessment (2018), Vol. 35, No. 9, pp. 1767	5.4.1 case b) Relevant but supplementary information: Includes information on residues in beer. Not directly relevant to dietary risk assessment but provides supplemental information.
367	Jarmul-Pietraszczyk J. et al.	CA 8.4.1	2012	Herbicide toxicity to the California earthworms Eisenia fetida Sav. and Dendrobaena veneta Rosa	Ecological Chemistry and Engineering A (2012), Vol. 19, No. 9, pp. 1133	5.4.1 case b) Relevant but supplementary information: This study compared the toxicity of three different commercially available formulations on the reproduction of earthworms, among them a glyphosate containing product (Glifocyd 360 SL). Further detail on active substance content, source and storage conditions were not provided. The study was not conducted according to a recognized test guideline nor under GLP. The origin of the earthworm species and their environmental holding conditions prior to and during the study have not been included. Information on the test soil characteristics is also missing and application of the test item to the soil is not described in detail. Sublethal and reproductive parameters of the control were reported, but information about control mortality is missing. In the chronic test only one single test item concentration was tested, with this information for the acute study missing. The endpoint generated from this study is given in mg/L and it is not clear how it can be transferred to soil concentrations as the bulk density in the test system is unknown and the statistical analysis is not provided in detail. Therefore, the endpoint presented is considered unreliable.
368	Jasper R. et al.	CA 5.3	2012	Evaluation of biochemical, hematological and oxidative parameters in mice exposed to the herbicide glyphosate-Roundup(®).	Interdisciplinary toxicology (2012), Vol. 5, No. 3, pp. 133	5.4.1 case b) Relevant but supplementary information: Gavaged formulated product, effects not attributable to glyphosate.
369	Jayasumana C. et al.	CA 5.9.2	2014	Glyphosate, hard water and nephrotoxic metals: are they the culprits behind the epidemic of chronic kidney disease of unknown etiology in Sri Lanka?.	International journal of environmental research and public health (2014), Vol. 11, No. 2, pp. 2125	5.4.1 case b) Relevant but supplementary information: Presents a hypothesis which is not tested, only discussed.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
370	Jayasumana C. et al.	CA 5.9.2	2015	Simultaneous exposure to multiple heavy metals and glyphosate may contribute to Sri Lankan agricultural nephropathy.	BMC nephrology (2015), Vol. 16, pp. 103	5.4.1 case b) Relevant but supplementary information: Presents a hypothesis which is not tested, only discussed
371	Jiang Y. et al.	CA 7.2.1.3	2016	The role of Fe(III) on phosphate released during the photo-decomposition of organic phosphorus in deionized and natural waters.	Chemosphere (2016), Vol. 164, pp. 208	5.4.1 case b) Relevant but supplementary information: Study of the role of Fe^{3+} in photodegradation of glyphosate in natural water.
372	Jofre D. M. et al.	CA 8.2.1	2013	Fish Toxicity of Commercial Herbicides Formulated With Glyphosate	Journal of Environmental & Analytical Toxicology. Vol. 4, no. 1, pp. 1	5.4.1 case b) Relevant but supplementary information: Data considered supplemental as the test design and the achieved endpoints are not those used in EU risk assessment. The test substance although not specifically identified, in terms of the SL salt of glyphosate, looks like it could be at a similar a.e. content.
373	Jomichen J. et al.	CA 5.9.1	2017	Australian work exposures studies: occupational exposure to pesticides.	Occupational and environmental medicine (2017), Vol. 74, No. 1, pp. 46	5.4.1 case b) Relevant but supplementary information: Occupational exposure survey.
374	Jovic-Stosic J. et al.	CA 5.9.5	2013	Lipid emulsion in treatment of cardiovascular collapse in acute poisoning.	Clinical Toxicology (2013), Vol. 51, No. 4, pp. 288.	5.4.1 case b) Relevant but supplementary information: This is a case series that included one patient with a formulated glyphosate overdose and treatment with ILE. This describes medical management of overdoses and should not impact re-registration.
375	Jovic-Stosic J. et al.	CA 5.9.5	2016	Intravenous lipid emulsion in treatment of cardiocirculatory disturbances caused by glyphosate-surfactant herbicide poisoning.	Vojnosanitetski pregled (2016), Vol. 73, No. 4, pp. 390	5.4.1 case b) Relevant but supplementary information: Medical case of intentional ingestion. ILE has been proposed as a possible therapy for formulated glyphosate overdoses. As this was a suicide attempt, this should not impact re-registration.
376	Jovic-Stosic J. et al.	CA 5.9.5	2016	Antidotal use of intravenous lipid emulsion: 5 years' experience in an intensive care unit.	Clinical Toxicology (2016), Vol. 54, No. 4, pp. 476.	5.4.1 case b) Relevant but supplementary information: This is a report about using ILE to treat overdoses with 1 patient who ingested formulated glyphosate. This paper should not impact re-registration.
377	Jyoti W. et al.	CA 5.9.5	2014	Esophageal perforation and death following glyphosate poisoning.	Journal of postgraduate medicine (2014), Vol. 60, No. 3, pp. 346	5.4.1 case b) Relevant but supplementary information: Formulated glyphosate can cause caustic injury to the mucosa membrane after ingestion. The esophagus is especially prone to perforation. Due to the absence of a serosa, the esophagus is notoriously difficult to repair & heal. This is not an unusual feature of caustic injury. As this was a suicide attempt, this should not impact re-registration.
378	Kachuri L. et al.	CA 5.5	2013	Multiple pesticide exposures and the risk of multiple myeloma	International Journal of Cancer (2013), Vol. 133, No. 8, pp. 1846	5.4.1 case b) Relevant but supplementary information: Exposure to multiple pesticides and a case control study which is subject to recall bias.
379	Kamijo Y. et al.	CA 5.9.5	2016	A multicenter retrospective survey of poisoning after ingestion of herbicides containing glyphosate potassium salt or other glyphosate salts in Japan.	Clinical toxicology (2016), Vol. 54, No. 2, pp. 147	5.4.1 case b) Relevant but supplementary information: This article discusses the incidence of hyperkalemia and multi-organ failure after formulated glyphosate ingestions. Neither of these findings are surprising in the setting of potassium salt or surfactant ingestions.
380	Kamijo Y. et al.	CA 5.9.5	2012	Glyphosate-surfactant herbicide products containing glyphosate potassium salt can cause fatal hyperkalemia if ingested in massive amounts.	Clinical toxicology (2012), Vol. 50, No. 2, pp. 159	5.4.1 case b) Relevant but supplementary information: This article discusses the fact that certain glyphosate-potassium salt formulations can cause fatal hyperkalemia in overdose. This article discusses a feature of suicidal ingestions and therefore should not impact registration decisions.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
381	Karasali H. et al.	CA 7.5	2019	Investigation of the presence of glyphosate and its major metabolite AMPA in Greek soils.	Environmental science and pollution research international (2019), Vol. 26, No. 36, pp. 36308	5.4.1 case b) Relevant but supplementary information: Paper provides data on glyphosate & AMPA concentrations in Greek soils, but there is no correlating information on glyphosate rates applied or any information on soil characterization.
382	Karberg K. et al.	CA 5.9.2	2018	Glyphosate levels in older adults.	JAMA - Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1384	5.4.1 case b) Relevant but supplementary information: Medical data which should not impact the re-registration.
383	Kato Y.	CA 5.9.5	2015	Three cases of an extreme hyperkalemia associated with glyphosate potassium herbicide poisoning	The Japanese journal of toxicology (2015), Vol. 28, No. 4, pp. 368	5.4.1 case b) Relevant but supplementary information: This article describes a case series of three patients who presented with extreme hyperkalemia after suicidal ingestion of formulated glyphosate. This is not unexpected in an ingestion involving glyphosate formulated product with potassium salts and should not affect re-registration.
384	Kawagashira Y. et al.	CA 5.9.5	2017	Vasculitic Neuropathy Following Exposure to a Glyphosate-based Herbicide.	Internal medicine (2017), Vol. 56, No. 11, pp. 1431	5.4.1 case b) Relevant but supplementary information: This article discussed the development of painful discoloration of the toes and feet four months after the patient spray applied formulated glyphosate to crops. Interestingly, the patient was taking warfarin therapeutically, which can cause the well-described "purple toe syndrome". There is not a mechanism by which sprayed formulated glyphosate can be absorbed by the skin and directly impact small vasculature or neurons in the feet.
385	Kennedy E. et al.	CA 8.6	2012	Herbiciding Phragmites australis: effects on litter decomposition, microbial biomass, and macroinvertebrate communities.	Fundamental and Applied Limnology (2012), Vol. 180, No. 4, pp. 309	5.4.1 case b) Relevant but supplementary information: This paper provides information that is considered relevant to the biodiversity.
386	Kepler R. M. et al.	CA 7.5	2019	Soil microbial communities in diverse agroecosystems exposed to the herbicide glyphosate.	Applied and environmental microbiology (2020), Vol. 18, No. 86	5.4.1 case b) Relevant but supplementary information: Not relevant to existing endpoint but provide support that glyphosate does not have a negative impact on soil microorganisms.
387	Khot R. et al.	CA 5.9.2	2018	Glyphosate poisoning with acute fulminant hepatic failure.	Asia Pacific Journal of Medical Toxicology (2018), Vol. 7, No. 3, pp. 86	5.4.1 case b) Relevant but supplementary information: glyphosate is not hepatotoxic by any route.
388	Kier L. D.	CA 5.4	2015	Review of genotoxicity biomonitoring studies of glyphosate-based formulations.	Critical reviews in toxicology (2015), Vol. 45, No. 3, pp. 209	5.4.1 case b) Relevant but supplementary information: review, secondary source
389	Kier L. D. et al.	CA 5.4	2013	Review of genotoxicity studies of glyphosate and glyphosate-based formulations.	Critical reviews in toxicology (2013), Vol. 43, No. 4, pp. 283	5.4.1 case b) Relevant but supplementary information: review, secondary source.
390	Kim E. et al.	CA 5.9.5	2016	Patterns of drugs & poisons in southern area of South Korea in 2014.	Forensic Science International (2016), Vol. 269, pp. 50	5.4.1 case b) Relevant but supplementary information: This is an article describing the chemicals / pharmaceuticals that were used in fatal overdoses that were forensically evaluated at the Busan Institute of National Forensic Services. Out of 606 fatalities, agricultural chemicals were involved in 5 and glyphosate was detected in 2 of the cases.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
391	Kim Y. H. et al.	CA 5.9.5	2014	Heart rate-corrected QT interval predicts mortality in glyphosate-surfactant herbicide-poisoned patients.	The American journal of emergency medicine (2014), Vol. 32, No. 3, pp. 203	5.4.1 case b) Relevant but supplementary information: This article discusses the utility of the QTc interval to predict mortality in suicidal ingestions of glyphosate-based formulation. It is not unexpected for critically ill patients to develop a long QTc.
392	Kim Y. H. et al.	CA 5.9.5	2016	Prognostic Factors in Emergency Department Patients with Glyphosate Surfactant Intoxication: Point-of-Care Lactate Testing.	Basic & clinical pharmacology & toxicology (2016), Vol. 119, No. 6, pp. 604	5.4.1 case b) Relevant but supplementary information: This study evaluated the use of lactate as a predictor of mortality and found a statistically significant association between a serum lactate of 4.7mmol/L and mortality in formulated glyphosate overdoses. This is not surprising as caustic injury due to detergent-like surfactants will cause cell death and thereby increase lactate levels. This article discusses predictors of mortality in suicidal ingestions and therefore should not impact registration decisions.
393	Kim Y-h.. et al.	CA 5.8	2013	Mixtures of glyphosate and surfactant TN20 accelerate cell death via mitochondrial damage-induced apoptosis and necrosis.	Toxicology in vitro : an international journal published in association with BIBRA (2013), Vol. 27, No. 1, pp. 191	5.4.1 case b) Relevant but supplementary information: In vitro cytotoxicity endpoints measured for glyphosate & surfactant along and in combination. No significant effects with glyphosate alone.
394	Kimmel G. L. et al.	CA 5.6.2	2013	Evaluation of developmental toxicity studies of glyphosate with attention to cardiovascular development.	Critical reviews in toxicology (2013), Vol. 43, No. 2, pp. 79	5.4.1 case b) Relevant but supplementary information: review, secondary source.
395	Kjaer J. et al.	CA 7.1.4.3, CA 7.5	2011	Reply to Comments on "Transport modes and pathways of the strongly sorbing pesticides glyphosate and pendimethalin through structured drained soils".	Chemosphere (2011), Vol. 85, No. 9, pp. 1539	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Reply to Comments on by Petersen et al_2011, Chemosphere (2011), Vol. 84. No. 4, pp. 471-479.
396	Klatyik S. et al.	CA 7.5	2017	Dissipation of the herbicide active ingredient glyphosate in natural water samples in the presence of biofilms	International journal of environmental analytical chemistry (2017), Vol. 97, No. 10, pp. 901	5.4.1 case b) Relevant but supplementary information: The article reports glyphosate dissipation in irradiated natural water samples from European surface waters under laboratory conditions. The water was only characterised for pH and conductivity. No dark control experiments were conducted. Average results of concentration measurements are only presented as graphical plots and not discussed in detail (focus on effect of biofilms). This publication is considered unreliable.
397	Knezevic V. et al.	CA 5.9.5	2012	Early continuous dialysis in acute glyphosate-surfactant poisoning	Srpski arhiv za celokupno lekarstvo (2012), Vol. 140, No. 9-10, pp. 648	5.4.1 case b) Relevant but supplementary information: Glyphosate based formulations can cause renal injury in overdose, and the K+ formulations may result in hyperkalemia. It is therefore reasonable to start hemodialysis or hemofiltration in critically ill patients with kidney failure or hyperkalemia. As this was a suicide attempt, this should not impact re-registration.
398	Knudsen L. E. et al.	CA 5.9.1	2017	Biomonitoring of Danish school children and mothers including biomarkers of PBDE and glyphosate.	Reviews on environmental health (2017), Vol. 32, No. 3, pp. 279	5.4.1 case b) Relevant but supplementary information: All glyphosate levels many orders of magnitude lower than the ADI.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
399	Kongtip P. et al.	CA 5.9.4	2019	Thyroid Hormones in Conventional and Organic Farmers in Thailand.	International journal of environmental research and public health (2019), Vol. 16, No. 15, pp. 2704	5.4.1 case b) Relevant but supplementary information: The higher incidence of thyroid disease in women (more numerous in organic farming), no data on the menopausal status of the women (change in thyroid hormones), the collection of data within dairies of the farmers may be incomplete, the exposure of farmers to pesticides prior to the study and prior to starting organic farming, and the results for glyphosate should have been examined for confounding from other pesticides that were correlated with glyphosate use. Moreover, the use rate and bioavailability (Acquavella et al. (2004) Environmental Health Perspectives Vol. 112(3), 321-326; Acquavella et al. (2006) Epidemiology, Vol. 17(1), 69-74) of glyphosate was lower than that of the other pesticides used. Since the determination of serum thyroid hormone levels is key in this study, the methods of analysis should have been better documented. This publication is considered unreliable.
400	Kuhn R. et al.	CA 7.1.2.1.2	2017	Identification of the Complete Photodegradation Pathway of Ethylenediaminetetra(methylenephosphonic acid) in Aqueous Solution	Clean: Soil, Air, Water (2017), Vol. 45, No. 5, pp. 1	5.4.1 case b) Relevant but supplementary information: Paper describes another source of AMPA other than glyphosate - supplemental information.
401	Kumar M. S. A. et al.	CA 8.2.4	2013	Toxic impacts of two organophosphorus pesticides on the acetylcholinesterase activity and biochemical composition of freshwater fairy shrimp Streptocephalus dichotomus.	International Journal of Pharma and Bio Sciences (2013), Vol. 4, No. 2, pp. B-966	5.4.1 case b) Relevant but supplementary information: The test does not follow a recognised test guideline. There are no details on the test design used in the exposure part of the test, such as test media preparation and test vessels / replication details, and the water quality / environmental conditions during the exposure period. Nor are there any validity criteria stated, which are necessary to establish the acceptability of the study (eg. shrimp cyst hatching success and the percentage survival in the control group in both toxicity tests). There are no biological data presented to confirm the reported LC50 values. There is no rationale described justifying the duration of exposure. Details on the test substances used in the test are not presented and there is no analytical verification of test concentrations, so exposure levels cannot be verified. The study is considered unreliable.
402	Kurenbach B. et al.	CA 5.8	2015	Sublethal exposure to commercial formulations of the herbicides dicamba, 2,4-dichlorophenoxyacetic acid, and glyphosate cause changes in antibiotic susceptibility in Escherichia coli and Salmonella enterica serovar Typhimurium.	mBio (2015), Vol. 6, No. 2, pp. E00009	5.4.1 case b) Relevant but supplementary information: Endpoints at doses tested not relevant to resides levels or to human health.
403	Kwiatkowska M. et al.	CA 5.8	2014	The effect of glyphosate, its metabolites and impurities on erythrocyte acetylcholinesterase activity.	Environmental toxicology and pharmacology (2014), Vol. 37, No. 3, pp. 1101	5.4.1 case b) Relevant but supplementary information: In vitro effects only noted at excessively high doses, 250-5000 uM.
404	Kylin H.	CA 7.5	2013	Time-integrated sampling of glyphosate in natural waters.	Chemosphere (2013), Vol. 90, No. 6, pp. 1821	5.4.1 case b) Relevant but supplementary information: Provides information on storage stability of surface water samples that can be used to evaluate results from other surface water monitoring studies.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
405	la Cecilia D. et al.	CA 7.1.1, CA 7.1.2	2018	Analysis of glyphosate degradation in a soil microcosm	Environmental pollution (2018), Vol. 233, pp. 201	5.4.1 case b) Relevant but supplementary information: Factors affecting chemical and microbial degradation of glyphosate.
406	la Cecilia D. et al.	CA 7.1.1.1	2018	Glyphosate dispersion, degradation, and aquifer contamination in vineyards and wheat fields in the Po Valley, Italy.	Water research (2018), Vol. 146, pp. 37	5.4.1 case b) Relevant but supplementary information: Numeric model used to predict glyphosate degradation in soil layers and concentrations of glyphosate and AMPA in shallow acquifer from use of glyphosate in vineyards and wheat fields in PoValley, Italy. See Conclusions for results of interest. Since model, not directly relevant to risk assessment, supplementary only.
407	Lam C. H. et al.	CA 8.2.6	2020	Toxicity of herbicides to cyanobacteria and phytoplankton species of the San Francisco Estuary and Sacramento-San Joaquin River Delta, California, USA.	Journal of environmental science and health. Part A, Toxic/hazardous substances & environmental engineering (2020), Vol. 5, pp. 107	5.4.1 case b) Relevant but supplementary information: As the composition of the Roundup used in the test cannot be confirmed, the study must be considered as being supplementary. Roundup Custom is for aquatic uses so would not contain surfactants. It is not clear from the study if the product was tested with an approved surfactant added or not as would be detailed on the label. There is limited information in the paper on the label. Roundup Custom is not the representative formulation for the renewal and aquatic uses are not on the current GAP table.
408	Langrand J. et al.	CA 5.9.2	2019	Increased severity associated with tallowamine in acute glyphosate poisoning.	Clinical toxicology (2020), Vol. 58, pp. 201	5.4.1 case b) Relevant but supplementary information: In this study, severe respiratory symptoms were also more frequently reported in the TA group. The surfactant properties of POEA are likely to cause aspiration pneumonitis which is a plausible explanation for the respiratory failure complicating severe GBF poisoning cases.
409	Larsen K. et al.	CA 5.3	2014	Effects of Sublethal Exposure to a Glyphosate-Based Herbicide Formulation on Metabolic Activities of Different Xenobiotic-Metabolizing Enzymes in Rats.	International journal of toxicology (2014), Vol. 33, No. 4, pp. 307	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo via drinking water (Roundup FULL II, 662 g/L potassium salt). Non-representative formulation for EU.
410	Larsen K. et al.	CA 5.8.2	2012	Effects of sub-lethal exposure of rats to the herbicide glyphosate in drinking water: glutathione transferase enzyme activities, levels of reduced glutathione and lipid peroxidation in liver, kidneys and small intestine.	Environmental toxicology and pharmacology (2012), Vol. 34, No. 3, pp. 811	5.4.1 case b) Relevant but supplementary information: Only 2 dose levels were used with only 4 animals per sex and per group. Effects were found on GSH in liver at sub-mg/kg bw dose levels which is not concordant with liver effects seen in regulatory toxicology studies performed at much higher dose levels. This publication is considered unreliable.
411	Larsson M. O. et al.	CA 6.9	2017	Quantifying dietary exposure to pesticide residues using spraying journal data	Food and Chemical Toxicology (2017), Vol. 105, pp. 407	5.4.1 case b) Relevant but supplementary information: Estimate of glyphosate exposure based on spray data in DK. Supplemental to risk assessment.
412	Larsson M. O. et al.	CA 6.9	2018	Refined assessment and perspectives on the cumulative risk resulting from the dietary exposure to pesticide residues in the Danish population	Food and Chemical Toxicology (2018), Vol. 111, pp. 207	5.4.1 case b) Relevant but supplementary information: Refined dietary risk assessment for Danish population. Supplementary to DRA included in submission.
413	LaVerda N. L. et al.	CA 5.9.4	2015	Pesticide Exposures and Body Mass Index (BMI) of Pesticide Applicators From the Agricultural Health Study	Journal of Toxicology and Environmental Health, Part A: Current Issues (2015), Vol. 78, No. 20, pp. 1255	5.4.1 case b) Relevant but supplementary information: No relevant endpoint for risk assessment.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
414	Le Mer C. et al.	CA 8.2.1	2013	Effects of chronic exposures to the herbicides atrazine and glyphosate to larvae of the threespine stickleback (Gasterosteus aculeatus).	Ecotoxicology and environmental safety (2013), Vol. 89, pp. 174	5.4.1 case b) Relevant but supplementary information: The glyphosate analytical concentrations were highly variable, but overall based on the 2008 dataset, the mean measured values were within 25% of the nominal exposure concentrations. The sticklebacks were obtained from the natural environment and therefore prior exposure to chemicals cannot be discounted, although the fish were selected from the same location in two different years and achieved similar assay results in both years. The test system was considered robust based on the performance of the two positive control groups. Concerning the test design, the study was conducted according to methods described in Hahlbeck (2004) ‘The juvenile threespined stickleback (Gasterosteus aculeatus L.) as a model organism for endocrine disruption: I. Sexual differentiation’ whilst all available information is presented in this paper, the environmental conditions employed during the chronic exposure part of the test are not confirmed and validity criteria are not clearly stated. The achieved measured concentrations were also lower than is required for this study type and analysis in one of the two studies described was not complete. Whether the study was conducted according to GLP cannot be confirmed from the paper. Given some of the uncertainty over elements of the test design, the study should be considered unreliable.
415	Le Tien D. et al.	CA 5.5	2013	Comments on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize"	Food and Chemical Toxicology (2013), Vol. 53, pp. 443	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
416	Lebov J. F. et al.	CA 5.9.4	2015	Pesticide exposure and end-stage renal disease risk among wives of pesticide applicators in the Agricultural Health Study	Environmental Research (2015), Vol. 143, No. Part_A, pp. 198	5.4.1 case b) Relevant but supplementary information: Glyphosate was not associated with ESRD, but this study did not have the detail necessary to provide reliable information. Mostly speculative information about exposure to glyphosate and other pesticides. This publication is considered unreliable.
417	Leccia F. et al.	CA 8.3	2016	Disruption of the chemical communication of the European agrobiont groundaX80X90dwelling spider Pardosa agrestis by pesticides	Journal of applied entomology (2016), Vol. 140, No. 8, pp. 609	5.4.1 case b) Relevant but supplementary information: Endpoints based on the impact of chemicals on spider pheromones are not used/required in EU level ecotoxicological risk assessments.
418	Ledoux M. L. et al.	CA 6.10.1	2020	Penetration of glyphosate into the food supply and the incidental impact on the honey supply and bees.	Food Control (2020), Vol. 109, pp. 106859	5.4.1 case b) Relevant but supplementary information: This publication is a review and does not provide any original data, but summarizes relevant data on honey.
419	Lee B. K. et al.	CA 5.9.5	2012	Continuous renal replacement therapy in a patient with cardiac arrest after glyphosate-surfactant herbicide poisoning.	Hong Kong Journal of Emergency Medicine (2012), Vol. 19, No. 3, pp. 214	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure and the use of CVVHD after suicidal ingestion of formulated glyphosate and should not impact re-registration.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
420	Lee D. H. et al.	CA 5.9.5	2017	Severe glyphosate-surfactant intoxication: Successful treatment with continuous renal replacement therapy.	Hong Kong Journal of Emergency Medicine (2017), Vol. 24, No. 1, pp. 40	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure and the use of dialysis after suicidal ingestion of formulated glyphosate and should not impact re-registration.
421	Lee GaWon et al.	CA 5.2.1	2018	Glyphosate surfactant herbicide toxicosis in a dog with hindlimb paresis and urinary incontinence	Journal of Veterinary Clinics (2018), Vol. 35, No. 4, pp. 144	5.4.1 case b) Relevant but supplementary information: Acute Pet Exposure which should not impact the re-registration.
422	Lee M-J. et al.	CA 5.9.2	2019	Hemodynamic changes after infusion of intravenous lipid emulsion to treat refractory hypotension caused by glyphosate-surfactant herbicide poisoning A case report.	Medicine (2019), Vol. 98, No. 3, pp. Article No.: e14156	5.4.1 case b) Relevant but supplementary information: This is an article describing the use of lipid emulsion in a suicidal overdose of formulated glyphosate. This has been well described in the literature as a possible intervention in critically ill patients.
423	Lee W. J. et al.	CA 5.9.5	2012	Incidence of acute occupational pesticide poisoning among male farmers in South Korea	American Journal of Industrial Medicine (2012), Vol. 55, No. 9, pp. 799	5.4.1 case b) Relevant but supplementary information: This article describes a survey performed to assess the incidence of pesticide poisoning in S. Korea. The researchers interviewed 1958 farmers and asked if they exhibited any of the 21 following symptoms: nausea, vomiting, diarrhoea, sore throat, runny nose, dyspnea, headache, dizziness, hyperactivity, profuse sweating, blurred vision, paresthesia, slurred speech, paralysis, chest pain, syncope, muscle weakness,skin irritation, eye irritation, lacrimation , and fatigue. Based on these answers they categorized the farmers into mild, moderate or severe occupational exposure categories. There were 26 formulated glyphosate exposures 17 mild and 9 moderate, with zero fatalities. Based on this self-reported exposure data, they made the following claim: "acute occupational pesticide poisoning was 24.7 (95% CI 22.1–27.2) per 100 male farmers, which corresponds to 209,512 cases across South Korea in 2010." This report supports the data that occupational exposure to glyphosate based products have a very low toxicity profile.
424	Lemma T. et al.	CA 5.8.2	2019	Disruption of giant unilamellar vesicles mimicking cell membranes induced by the pesticides glyphosate and picloram	Biophysical chemistry (2019), Vol. 250, pp. 106176	5.4.1 case b) Relevant but supplementary information: Novel assays and endpoints not applicable/reliable for risk assessment.
425	Lenkowski J. R. et al.	CA 8.1.4	2010	Low concentrations of atrazine, glyphosate, 2,4-dichlorophenoxyacetic acid, and triadimefon exposures have diverse effects on Xenopus laevis organ morphogenesis.	Journal of environmental sciences (2010), Vol. 22, No. 9, pp. 1305	5.4.1 case b) Relevant but supplementary information: Toxicity of glyphosate and other chemistry to amphibians to assess malformations, up to 5 mg/L. Static renewal at 24 hr in 48 hr study. Conducted in the US. No relevant endpoint generated for the glyphosate RA renewal.
426	Leon M. E. et al.	CA 5.9.4	2019	Pesticide use and risk of non-Hodgkin lymphoid malignancies in agricultural cohorts from France, Norway and the USA: a pooled analysis from the AGRICOH consortium.	International journal of epidemiology (2019), Vol. 1, No. 48, pp. 1519	5.4.1 case b) Relevant but supplementary information: Due to an error prone exposure methodology and the attendant inability to control confounding. We also note that the results for the Norwegian cohort conflict with the AHS results where exposure is determined more specifically and where there is no relationship between glyphosate and DLBCL among individuals in the highest exposed quartile (≥ 108 days). This publication is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
427	Li H. et al.	CA 7.1.1, CA 7.1.2	2016	Degradation and Isotope Source Tracking of Glyphosate and Aminomethylphosphonic Acid.	Journal of agricultural and food chemistry (2016), Vol. 64, No. 3, pp. 529	5.4.1 case b) Relevant but supplementary information: Provides information on the molecular mechanism of glyphosate degradation. No information relevant for route of degradation.
428	Li Jia et al.	CA 8.2	2017	Acute toxicity study of glyphosate and cyhalofop-butyl to Daphnia carinata.	Acta Prataculturae Sinica (2017), Vol. 26, No. 9, pp. 148	5.4.1 case b) Relevant but supplementary information: The herbicides evaluated in the study were a 41% glyphosate isopropylamine saline water agent. The study was not conducted according to GLP and the test substance source could not be verified. The authors state that glyphosate has an obvious dose-effect relation to the moving inhibition and fatality rate of Daphnia carinatas. The routinely used concentration of the two is significantly higher than the LC50 and is strongly toxic to Daphnia carinatas. However, given the lack of standard guidelines, an unclear method design and approach, as well as challenges in interpreting the study results make reaching any conclusions arising from the study challenging at best.
429	Li Jiao et al.	CA 8.2	2010	Acute Toxicity of Eight Pesticides on the Development of Sea Urchin Embryos.	Asian Journal of Ecotoxicology (2010), Vol. 5, No. 2, pp. 255	5.4.1 case b) Relevant but supplementary information: The study of the toxicity to the sea urchin embryos, was not conducted or based on a relevant guideline. Test concentrations were from 0.1 to 50 mg/L of glyphosate technical. The relationship between EC50 and LogP values was the main discussion of the article.
430	Liao L-H. et al.	CA 8.3.1	2017	Behavioral responses of honey bees (Apis mellifera) to natural and synthetic xenobiotics in food.	Scientific reports (2017), Vol. 7, No. 1, pp. 15924	5.4.1 case b) Relevant but supplementary information: Presented data based on preference behaviour of honey bees cannot be directly related to an EU level ecotoxicological risk assessment - may possibly be used to support a lack of effects despite evidence being based upon preference.
431	Liao Y. et al.	CA 6.9	2018	Validation and application of analytical method for glyphosate and glufosinate in foods by liquid chromatography-tandem mass spectrometry.	Journal of chromatography. A (2018), Vol. 1549, pp. 31	5.4.1 case b) Relevant but supplementary information: This is primarily an analytical method paper, but does include EU monitoring results on 136 food samples (only 2 residues detected).
432	Lieshchova M. A. et al.	CA 5.3	2018	Combined effect of glyphosphate, saccharin and sodium benzoate on rats.	Regulatory Mechanisms in Biosystems (2018), Vol. 9, No. 4, pp. 591	5.4.1 case b) Relevant but supplementary information: Substantially lower water consumption in glyphosate only group confounds data and makes endpoint comparisons meaningless.
433	Lin JingWen et al.	CA 8.6	2015	Toxic effect of glyphosate on seed germination and seedling growth of Chinese fir.	Acta Agriculturae Universitatis Jiangxiensis (2015), Vol. 37, No. 5, pp. 843	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP, but it is well documented although no relevant guidelines have been followed. The authors state that the seed germination rate as well as the root length, stem length, leaf length and fresh weight of seedlings decreased significantly with the increase of glyphosate and the root length was more sensitive to glyphosate than other indexes. It was concluded that there is an inhibitory effect of glyphosate on Chinese fir seeds and seedlings, which led to antioxidant enzyme dysfunction, oxidative damage of cells and reduced chlorophyll synthesis. No analytical verification of the test item concentrations was performed, and the findings do not generate endpoints relevant to the regulatory risk assessment of glyphosate.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
434	Ling C. et al.	CA 5.9.4	2018	Prenatal Exposure to Ambient Pesticides and Preterm Birth and Term Low Birthweight in Agricultural Regions of California.	Toxics (2018), Vol. 6, No. 3, pp. E41	5.4.1 case b) Relevant but supplementary information: Unproven assumption that residence near land treated with pesticides equates to meaningful exposure. Glyphosate biomonitoring would suggest that is highly implausible. Also, residence on birth certificates is an uncertain indicator of residential proximity to treated land during pregnancy. This publication is considered unreliable.
435	Ling S. L. et al.	CA 5.9.5	2018	Workplace chemical and toxin exposures reported to a Poisons Information Centre: A diverse range causing variable morbidity.	European Journal of Emergency Medicine (2018), Vol. 25, No. 2, pp. 134	5.4.1 case b) Relevant but supplementary information: This article describes the characteristics of toxin/chemical exposures reported to an Austrailian poison center. Glyphosate is mentioned in 1 table only with no description of effects.
436	Liu Xiao-wei et al.	CA 8.2.4.2, CA 8.2.5.2	2012	Toxicological effect of paraquat and glyphosate on cladoceran Moina macrocopa.	Shengtaixue Zazhi (2012), Vol. 31, No. 8, pp. 1984	5.4.1 case b) Relevant but supplementary information: The conclusions are unclear based on several factors including the impact of the density of the algal food source and the temperature of the test media. This study is not adequately described – for example, water quality / environmental conditions cannot be confirmed from the paper, there were no validity criteria stated and no analytical verification of exposure concentrations was undertaken. Given the uncertainty over the test design and the procedures undertaken and the fact that the study was not conducted according to a recognised test guideline relevant for the EU risk assessment, the test is considered as unreliable.
437	Lopez Gonzalez E. C. et al.	CA 5.4	2017	Micronuclei and other nuclear abnormalities on Caiman latirostris (Broad-snouted caiman) hatchlings after embryonic exposure to different pesticide formulations.	Ecotoxicology and environmental safety (2017), Vol. 136, pp. 84	5.4.1 case b) Relevant but supplementary information: This study looks at the impact of pesticide formulations on the nuclear developments of Caimen embryos via topical application to their eggs shells after laying. The endpoints achieved cannot be related to EU risk assessment.
438	Lu Li-li et al.	CA 8.3.2, CP 10.3.2	2010	Effects of glyphosate on the growth and development of Agasicles hygrophila	Huanan Nongye Daxue Xuebao (2010), Vol. 31, pp. 22	5.4.1 case b) Relevant but supplementary information: The test substance is 41% glyphosate IPA salt. The study on Agasicles hygrophila was not conducted or based on a relevant NTA guideline.
439	Lugowska K.	CA 8.2.2.1, CP 10.2.3	2018	The effects of Roundup on gametes and early development of common carp (Cyprinus carpio L)	Fish physiology and biochemistry (2018), Vol. 44, No. 4, pp. 1109	5.4.1 case b) Relevant but supplementary information: The material and methods part of the study lack some important information. The preparation of test solutions is missing. The time course of the experiment is unclear. Furthermore, there was no analytical verification of test concentrations reported. Suitable exposure throughout the study was not demonstrated and thus the reliability of the study is questionable. The performance / validity of the test cannot be confirmed as there was no positive control included validity criteria were not stated. No regulatory endpoint useful for risk assessment is given. The study is not to a guideline and is not GLP.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
440	Luo W. et al.	CA 5.9.5	2019	Surgical treatment of pyloric stenosis caused by glyphosate poisoning: A case report.	Medicine (2019), Vol. 98, No. 30, pp. e16590	5.4.1 case b) Relevant but supplementary information: This article describes a case report of gastric ulceration and swelling causing pyloric obstruction in a patient who ingested formulated glyphosate. This is not unexpected as formulations contain surfactants which can cause caustic injury to the GI tract with suicidal ingestions. This should not impact re-registration.
441	Mahendrakar K. et al.	CA 5.9.5	2014	Glyphosate surfactant herbicide poisoning and management.	Indian journal of critical care medicine (2014), Vol. 18, No. 5, pp. 328	5.4.1 case b) Relevant but supplementary information: ILE has been proposed as a possible therapy for formulated glyphosate overdoses.
442	Maillard E. et al.	CA 7.5	2012	Removal of dissolved pesticide mixtures by a stormwater wetland receiving runoff from a vineyard catchment: an inter-annual comparison	International journal of environmental analytical chemistry (2012), Vol. 92, No. 8, pp. 979	5.4.1 case b) Relevant but supplementary information: Confirmatory data showing storm water wetlands removed glyphosate/AMPA from agricultural runoff.
443	Mailler R. et al.	CA 7.5	2014	Biofiltration vs conventional activated sludge plants: what about priority and emerging pollutants removal?	Environmental Science and Pollution Research (2014), Vol. 21, No. 8, pp. 5379	5.4.1 case b) Relevant but supplementary information: Paper compares glyphosate removal in waste water treatment by two primary and two biological treatments.
444	Malhotra R. C. et al.	CA 5.9	2010	Glyphosate-surfactant herbicide-induced reversible encephalopathy.	Journal of clinical neuroscience (2010), Vol. 17, No. 11, pp. 1472	5.4.1 case b) Relevant but supplementary information: This paper describes prolonged encephalopathy in a suicidal glyphosate ingestion. There is no mention of the medication that was used for sedation while the patient was intubated in the ICU. Accumulations of lorazepam and other sedatives may result in prolonged coma. In formulated glyphosate overdose with multi-organ failure it is common to sedate patients until their haemodynamics improve. As this document encompasses suicidal overdose, this paper should not impact re-registration.
445	Mandiki S. N. M. et al.	CA 7.5	2014	Effect of land use on pollution status and risk of fish endocrine disruption in small farmland ponds	Hydrobiologia (2014), Vol. 723, No. 1, pp. 103	5.4.1 case b) Relevant but supplementary information: Provides glyphosate concentrations in 15 Belgian ponds in different seasons and different land uses. End-points cannot be used directly in the risk assessment for the renewal of glyphosate at EU level. Only summary glyphosate concentrations available.
446	Manfo F. P. T. et al.	CA 5.6	2012	Effect of agropesticides use on male reproductive function: A study on farmers in Djutitsa (Cameroon)	Environmental Toxicology (2012), Vol. 27, No. 7, pp. 423	5.4.1 case b) Relevant but supplementary information: No glyphosate specific conclusions, confounded due to multiple pesticide uses.
447	Maqueda C. et al.	CA 7.1.3.1.1, CA 7.2.1.3	2017	Behaviour of glyphosate in a reservoir and the surrounding agricultural soils.	The Science of the total environment (2017), Vol. 593-594, pp. 787	5.4.1 case b) Relevant but supplementary information: Confirmatory data on sorption and water/sediment behaviour and natural water photolysis of glyphosate.
448	Mariager T. P. et al.	CA 5.9.2	2013	Severe adverse effects related to dermal exposure to a glyphosate-surfactant herbicide.	Clinical toxicology (2013), Vol. 51, No. 2, pp. 111	5.4.1 case b) Relevant but supplementary information: No new effects are discussed in the publication. Adverse effects of formulations in case of dermal exposure are well known. The data should not impact the re-registration.
449	McClellan R. O.	CA 5.5	2016	Evaluating the potential carcinogenic hazard of glyphosate.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 1	5.4.1 case b) Relevant but supplementary information: Forward by Editor in Chief to a special edition on glyphosate in Critical Reviews in Toxicology.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
450	McQueen H. et al.	CA 6.9	2012	Estimating maternal and prenatal exposure to glyphosate in the community setting.	International journal of hygiene and environmental health (2012), Vol. 215, No. 6, pp. 570	5.4.1 case b) Relevant but supplementary information: Study estimated dietary exposure of pregnant women to glyphosate by survey and food analysis. Exposure is well within the National Estimated Daily Intake.
451	Mesnage R. et al.	CA 5.5	2017	Multiomics reveal non-alcoholic fatty liver disease in rats following chronic exposure to an ultra-low dose of Roundup herbicide.	Scientific reports (2017), Vol. 7, pp. 39328	5.4.1 case b) Relevant but supplementary information: Formulation tested (Roundup, composition not described). Livers obtained from research of republished retreated Seralini rat study.
452	Mesnage R. et al.	CA 5.8	2013	Ethoxylated adjuvants of glyphosate-based herbicides are active principles of human cell toxicity.	Toxicology (2013), Vol. 313, No. 2-3, pp. 122	5.4.1 case b) Relevant but supplementary information: Formulations, surfactants and glyphosate tested in vitro. Effects attributable to surfactant cytotoxicity.
453	Mesnage R. et al.	CA 5.8	2017	Facts and Fallacies in the Debate on Glyphosate Toxicity.	Frontiers in public health (2017), Vol. 5, pp. 316	5.4.1 case b) Relevant but supplementary information: review, secondary source.
454	Mesnage R. et al.	CA 5.8	2014	Major pesticides are more toxic to human cells than their declared active principles.	BioMed research international (2014), Vol. 2014, pp. 179691	5.4.1 case b) Relevant but supplementary information: In vitro cytotoxicity data at high doses not informative for hazard characterization.
455	Mesnage R. et al.	CA 5.8.2	2015	Potential toxic effects of glyphosate and its commercial formulations below regulatory limits.	Food and chemical toxicology (2015), Vol. 84, pp. 133	5.4.1 case b) Relevant but supplementary information: review, secondary source.
456	Mesnage R. et al.	CA 5.9.1	2012	Glyphosate exposure in a farmer's family.	Journal of Environmental Protection (2012), Vol. 3, No. 9, pp. 1001	5.4.1 case b) Relevant but supplementary information: Glyphosate measured in urine of farmer and family.
457	Milesi M. M. et al.	CA 5.6.1	2018	Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats.	Archives of toxicology (2018), Vol. 92, No. 8, pp. 2629	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
458	Milesi M. M. et al.	CA 5.6.1	2019	Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats.	Archives of toxicology (2019), Vol. 93, No. 12, pp. 3635	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
459	Mills P. J. et al.	CA 5.9.1	2017	Excretion of the Herbicide Glyphosate in Older Adults Between 1993 and 2016.	Journal of the American Medical Association (2017), Vol. 318, No. 16, pp. 1610	5.4.1 case b) Relevant but supplementary information: Not relevant for EU toxicology risk assessment but supplementary information on human exposure.
460	Mills P. J. et al.	CA 5.9.1	2018	Excretion of the herbicide glyphosate in older adults between 1993 and 2016 (vol 318, pg 1610, 2017)	Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1386	5.4.1 case b) Relevant but supplementary information: Correction to Mills et al._2017, Journal of the American Medical Association (2017), Vol. 318, No. 16, pp. 1610-1611.
461	Mills P. J. et al.	CA 5.9.2	2018	Erratum: Excretion of the herbicide glyphosate in older adults between 1993 and 2016.	Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1386	5.4.1 case b) Relevant but supplementary information: Erratum listing undisclosed conflicts of interest on a previous paper, Mills_2017, Journal of the American Medical Association (2017), Vol. 318, No. 16, pp. 1610-1611.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
462	Mills P. J. et al.	CA 5.9.2	2020	Glyphosate Excretion is Associated With Steatohepatitis and Advanced Liver Fibrosis in Patients With Fatty Liver Disease.	Clinical gastroenterology and hepatology (2020), Vol. 8, pp. 741	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment. This paper should not impact the re-registration.
463	Mills P. J. et al.	CA 5.9.2	2018	Undisclosed conflicts of interest	Journal of the American Medical Association (2018), Vol. 319, No. 13, pp. 1386	5.4.1 case b) Relevant but supplementary information: Correction to Mills et al._2017, Journal of the American Medical Association 2017, Vol. 318, No. 16, pp. 1610-1611.
464	Mink P. J. et al.	CA 5.9.4	2011	Epidemiologic studies of glyphosate and non-cancer health outcomes: a review.	Regulatory toxicology and pharmacology (2011), Vol. 61, No. 2, pp. 172	5.4.1 case b) Relevant but supplementary information: This is an epidemiology review article on non-cancer endpoints.
465	Mink P. J. et al.	CA 5.9.4	2012	Epidemiologic studies of glyphosate and cancer: a review.	Regulatory toxicology and pharmacology (2012), Vol. 63, No. 3, pp. 440	5.4.1 case b) Relevant but supplementary information: review, secondary source.
466	Mise M.	CA 5.9.4	2011	Epidemiological study of glyphosate herbicide poisoning.	The Japanese journal of toxicology (2011), Vol. 24, No. 1, pp. 69	5.4.1 case b) Relevant but supplementary information: Epidemiological analysis of acute poisoning cases due to oral ingestion of glyphosate (suicide attempts), clinical symptoms such as metabolic acidosis, hyperkalemia, electrocardiogram abnormalities are known effects and should not impact the re-registration.
467	Mohamed F. et al.	CA 5.9.5	2016	Mechanism-specific injury biomarkers predict nephrotoxicity early following glyphosate surfactant herbicide (GPSH) poisoning.	Toxicology letters (2016), Vol. 258, pp. 1	5.4.1 case b) Relevant but supplementary information: This article discusses the use of biomarkers to predict kidney injury in formulated glyphosate overdose and predictors of nephrotoxicity in suicidal ingestions and therefore should not impact registration decisions.
468	Mohamed I. A-w. et al.	CA 8.2.8	2016	Unique efficacy of certain novel herbicides against Culex pipiens (Diptera: Culicidae) mosquito under laboratory conditions	Advances in Environmental Biology (2016), Vol. 10, No. 8, pp. 104	5.4.1 case b) Relevant but supplementary information: Important information is missing in the material and methods section. The preparation and application of the test solutions as well as the tested concentration range were not reported. The test items were not adequately specified. It is not clear whether the test concentrations refer to the product or to the active substance. Moreover one active ingredient is given as glyphosate isopropylamine which should be formulated as a salt resulting in test concentrations as acid equivalents. In addition, the biological results of the test were not sufficiently stated. No mortality data for the test concentrations nor for the controls was given to evaluate the results. Furthermore, there was no analytical verification of test concentrations reported. The study is not to a guideline and is not GLP. The study is considered unreliable.
469	Moon J. M. et al.	CA 5.9	2010	Predicting acute complicated glyphosate intoxication in the emergency department.	Clinical toxicology (2010), Vol. 48, No. 7, pp. 718	5.4.1 case b) Relevant but supplementary information: The results of this study showed that age > 50 years, X-ray abnormalities, and ALT > 40 U/L were significant predictive factors for complications in patients with glyphosate surfactant herbicide poisoning; patients with these findings might require admission to the intensive care unit.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
470	Moon J. M. et al.	CA 5.9.2	2018	Cardiovascular Effects and Fatality May Differ According to the Formulation of Glyphosate Salt Herbicide.	Cardiovascular toxicology (2018), Vol. 18, No. 1, pp. 99	5.4.1 case b) Relevant but supplementary information: Preliminary results without investigation of other factors contributing to such effects.
471	Moon J. M. et al.	CA 5.9.5	2016	The characteristics of emergency department presentations related to acute herbicide or insecticide poisoning in South Korea between 2011 and 2014.	Journal of toxicology and environmental health. Part A (2016), Vol. 79, No. 11, pp. 466	5.4.1 case b) Relevant but supplementary information: This study showed a decrease in the case fatality rate of suicidal pesticide ingestions between 2011-2014 in South Korea. This clearly demonstrates that herbicides with a lower acute toxicity profile are associated with lower mortality in suicidal ingestions.
472	Mottier A. et al.	CA 8.2.8	2013	Effects of glyphosate-based herbicides on embryo-larval development and metamorphosis in the Pacific oyster, Crassostrea gigas.	Aquatic toxicology (2013), Vol. 128-129, pp. 67	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP and/or according to a recognized test guideline and there are no validity criteria presented. The authors state that the EC50 values computed for the embryotoxicity tests with glyphosate and AMPA were lower than the values reported for regulatory model organisms. The embryotoxicity test appeared more sensitive but also a little more difficult to assess compared to the metamorphosis assay. Given the limitations cited, the study is considered unreliable.
473	Mueller U. et al.	CA 5.9.1	2012	Comment on "Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Townships of Quebec, Canada".	Reproductive Toxicology (2012), Vol. 33, No. 3, pp. 401	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comments on Aris et al._2011, Reprod. Toxicol (2011), Vol. 31, pp. 528-533.
474	Munz N. et al.	CA 7.5	2012	Pesticide measurements in watercourses	Aqua & Gas (2012), Vol. 92, No. 11, pp. 32	5.4.1 case b) Relevant but supplementary information: Describes evaluation of concentrations of glyphosate and other PPP's and biocides from flowing water bodies of different sizes in Switzerland. Total 545 sites (32 sites for glyphosate). Only data presented is Maximum and Mean concentrations across all sites.
475	Muskus A. M. et al.	CA 7.1.1.1, CA 7.1.2.1.1	2019	Effect of temperature, pH and total organic carbon variations on microbial turnover of (13)C3(15)N-glyphosate in agricultural soil.	The Science of the total environment (2019), Vol. 658, pp. 697	5.4.1 case b) Relevant but supplementary information: Study of effect of temperature, soil pH, total organic carbon on degradation of 13C and 15N glyphosate to nonextractable residues. Study conducted in Germany. Provides supplemental information as non-extractable residues are not directly considered in the risk assessment.
476	Mutzner L. et al.	CA 7.5	2016	Model-based screening for critical wet-weather discharges related to micropollutants from urban areas.	Water research (2016), Vol. 104, pp. 547	5.4.1 case b) Relevant but supplementary information: Model to predict glyphosate concentration from storm water outlets and combined sewer overflows. Glyphosate does not exceed EQS based on conservative modeling. Not directly relevant for risk assessment but useful information.
477	Nakae H. et al.	CA 5.9.5	2015	Paralytic ileus induced by glyphosate intoxication successfully treated using Kampo medicine.	Acute medicine & surgery (2015), Vol. 2, No. 3, pp. 214	5.4.1 case b) Relevant but supplementary information: This article describes alternative medicine therapies that were used to treat a Japanese woman with a paralytic ileus after glyphosate ingestion. It is not uncommon for patients in a critical care setting to develop an ileus. These tend to resolve on their own without intervention. I cannot be commented on whether this intervention increases GI motility.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
478	Nakayama T. et al.	CA 5.9.5	2019	Renal cortical hypoperfusion caused by glyphosate-surfactant herbicide.	Clinical and experimental nephrology (2019), Vol. 23, No. 6, pp. 865	5.4.1 case b) Relevant but supplementary information: This was a suicidal ingestion of formulated glyphosate that resulted in poor renal perfusion & multiorgan failure. Since this was a suicidal ingestion, the outcome is not unexpected and should not impact the re-egistration.
479	Nathan V. K. et al.	CA 8.5	2020	Pesticide application inhibit the microbial carbonic anhydrase-mediated carbon sequestration in a soil microcosm.	Environmental science and pollution research international (2020), Vol. 27, pp. 4468	5.4.1 case b) Relevant but supplementary information: Endpoints presented are not relevant to the direct effects assessment required for Annex I renewal. However, it does inform in other areas, e.g biodiversity / benefits of glyphosate use.
480	Nedopitanska N. M.	CA 5.5	2011	Problem of the carcinogenic danger of glyphosate; new data	Sovremennye Problemy Toksikologii (2011) No. 1-2, pp. 5	5.4.1 case b) Relevant but supplementary information: review, secondary source.
481	Nevius B. A. et al.	CA 8.4.2	2012	Surface-functionalization effects on uptake of fluorescent polystyrene nanoparticles by model biofilms.	Ecotoxicology (2012), Vol. 21, No. 8, pp. 2205	5.4.1 case b) Relevant but supplementary information: This paper discusses the results of an earthworm avoidance study which is not an endpoint type used in EU level risk assessment for Annex I renewal. Therefore it is considered to be supplementary. No effects were observed for glyphosate exposure.
482	Nguyen N. K. et al.	CA 7.1.2.1.1	2018	Large variation in glyphosate mineralization in 21 different agricultural soils explained by soil properties.	The Science of the total environment (2018), Vol. 627, pp. 544	5.4.1 case b) Relevant but supplementary information: Study of 21 European soils to determine factors influencing glyphosate mineralization. Exchangeable acidity identified as only univariate factor with negative correlation. NaOH extractable residues have strong negative correlation with glyphosate mineralizaiton. Doesn't fit risk assessment directly but provides useful information.
483	Niemann L. et al.	CA 5.9.2	2015	A critical review of glyphosate findings in human urine samples and comparison with the exposure of operators and consumers.	Journal fuer Verbraucherschutz und Lebensmittelsicherheit/Journal of Consumer Protection and Food Safety (2015), Vol. 10, No. 1, pp. 3	5.4.1 case b) Relevant but supplementary information: review, secondary source.
484	Nunez S. et al.	CA 8.5	2015	In vitro effect of N-(phosphonomethyl) glycine agrochemicals on total heterotrophic bacteria and azotobacter chroococcum.	Biocell (2015), Vol. 39, Suppl. 1. Abstract No.: A71.	5.4.1 case b) Relevant but supplementary information: Endpoints based on the effects of glyphosate on bacteria in soil are not considered in the EU level ecotox risk assessmen for Annex I renewal.
485	Okada E. et al.	CA 7.1.3.1.1, CA 7.1.4.1.1	2016	Adsorption and mobility of glyphosate in different soils under no-till and conventional tillage.	Geoderma (2016), Vol. 263, pp. 78	5.4.1 case b) Relevant but supplementary information: Soil adsorption data for glyphosate are reported but they are well within the numbers provided in the dossier.
486	Ollivier L.	CA 5.5	2013	A Comment on "Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize".	Food and Chemical Toxicology (2013), Vol. 53, pp. 458	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
487	Ololade I. A. et al.	CA 7.1.3	2014	Sorption of Glyphosate on Soil Components: The Roles of Metal Oxides and Organic Materials	Soil & sediment contamination (2014), Vol. 23, No. 5, pp. 571	5.4.1 case b) Relevant but supplementary information: No new data presented, therefore supplementary. This publication is also considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
488	Ordonez J. et al.	CA 5.9.5	2013	Non-Ethanol hyperlipasemia in toxicology consultation.	Clinical Toxicology (2013), Vol. 51, No. 7, pp. 703	5.4.1 case b) Relevant but supplementary information: This is a case series looking at the toxic causes of pancreatitis in overdose patients. One of whom had ingested formulated glyphosate. This should not imapct re-registration.
489	Owagboriaye F. et al.	CA 5.8.2	2019	Comparative studies on endogenic stress hormones, antioxidant, biochemical and hematological status of metabolic disturbance in albino rat exposed to roundup herbicide and its active ingredient glyphosate.	Environmental science and pollution research international (2019), Vol. 26, No. 14, pp. 14502	5.4.1 case b) Relevant but supplementary information: Purity not reported. Test species are not clearly and completely described. Insufficient information is given on the biochemical methods used. This publication is considered unreliable.
490	Owagboriaye F. O. et al.	CA 5.6	2017	Reproductive toxicity of Roundup herbicide exposure in male albino rat.	Experimental and toxicologic pathology (2017), Vol. 69, No. 7, pp. 461	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Roundup 441 g/L potassium salt, 360 g/L a.e.).
491	Ozaki T. et al.	CA 5.9.5	2017	Severe Glyphosate-Surfactant Intoxication Successfully Treated With Continuous Hemodiafiltration and Direct Hemoperfusion: Case Report.	Therapeutic apheresis and dialysis (2017), Vol. 21, No. 3, pp. 296	5.4.1 case b) Relevant but supplementary information: This article discusses the use of haemodialysis and haemofiltration in formulated glyphosate overdoses.This article discusses medical management of suicidal ingestions and therefore should not impact registration decisions.
492	Ozbay B. et al.	CA 7.1.3.1.1	2018	Sorption and desorption behaviours of 2,4-D and glyphosate in calcareous soil from Antalya, Turkey	Water and environment journal (2018), Vol. 32, No. 1, pp. 141	5.4.1 case b) Relevant but supplementary information: Test soil was selected to be representative for the region of Antalya, Turkey. The use of oven-dried soil is considered not appropriate for the risk assessment.
493	Padilla J. T. et al.	CA 7.1.3.1.1	2019	Interactions among Glyphosate and Phosphate in Soils: Laboratory Retention and Transport Studies.	Journal of environmental quality (2019), Vol. 48, No. 1, pp. 156	5.4.1 case b) Relevant but supplementary information: Study conducted with U.S. soils but shows that Kf values of glyphosate are lower in the presence of phosphate. Addition of phosphate also impacts glyphosate movement in soil columns. Kf values are in range of previously reported.
494	Paganelli A. et al.	CA 8.1.5	2010	Glyphosate-based herbicides produce teratogenic effects on vertebrates by impairing retinoic acid signaling.	Chemical research in toxicology (2010), Vol. 23, No. 10, pp. 1586	5.4.1 case b) Relevant but supplementary information: Study to look at the effect of glyphosate product on the developmental effects of xenopus laevis embryos. Glyphosate injected into embryos. No relevant endpoint generated for the regulatory risk assessment of glyphosate renewal. High concentrations, unrealistic route of exposure. Conducted in Argentina.
495	Palli E. et al.	CA 5.9.2	2011	Rapture of the large intestine caused by severe oral glyphosate-surfactant intoxication.	The American journal of emergency medicine (2011), Vol. 29, No. 4, pp. 459	5.4.1 case b) Relevant but supplementary information: This article describes corrosive injury to the transverse colon in a suicidal ingestion of formulated glyphosate. This is known to occur in suicidal overdoses and should not impact re-registration
496	Palma G.	CA 5.8.3	2011	Letter to the editor regarding the article by Paganelli et al.	Chemical research in toxicology (2011), Vol. 24, No. 6, pp. 775	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, reply to Paganelli et al._2010, Chem. Res. Toxicol. (2010), Vol. 23, pp. 1586-1595.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
497	Pan LiPing et al.	CA 5.9	2016	Analysis of liver index of workers exposed to glyphosate	Journal of Environmental & Occupational Medicine (2016), Vol. 33, No. 4, pp. 380	5.4.1 case b) Relevant but supplementary information: This article examined the liver function in 345 workers exposed to glyphosate through manufacturing and 345 controls. The sample size is small, and it was claimed that there was a statitically signigicant difference between cholinesterase levels between groups. This is not related to glyphosate as it is not a cholinesterase inhibitor. It was also found that there were markers of liver pathology on ultrasound, which wouldn't be related to glyphosate as this has been extensively evaluated through GLP studies.
498	Pandey A. et al.	CA 5.8.3	2015	Analysis of endocrine disruption effect of Roundup(®) in adrenal gland of male rats.	Toxicology reports (2015), Vol. 2, pp. 1075	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Roundup, 41%, India).
499	Pandey P. et al.	CA 7.1.3.1.1	2019	Assessing Glyphosate and Fluridone Concentrations in Water Column and Sediment Leachate.	Frontiers in Environmental Science (2019), Vol. 7, pp. Article No.: 22	5.4.1 case b) Relevant but supplementary information: This U.S. study was aimed to improve the existing understanding of the deposition of herbicides from water column to bed sediment and leachate of herbicides from bed sediment to water column. The study was prompted by herbicide treatment of water for aquatic weeds. Results may provide useful information although not directly relevant for EU risk assessment.
500	Panettieri M. et al.	CA 8.6	2013	Glyphosate effect on soil biochemical properties under conservation tillage	Soil & tillage research (2013), Vol. 133, pp. 16	5.4.1 case b) Relevant but supplementary information: The paper describes different tillage techniques following use of glyphosate and the impact on soil properties. Not relateable directly to risk assessment for renewal but may be useful in the biodiversity and benefits discussions.
501	Panetto O. S. et al.	CA 8.2.2	2019	The effects of Roundup® in embryo development and energy metabolism of the zebrafish (Danio rerio)	Comparative biochemistry and physiology (2019), Vol. 222, pp. 74	5.4.1 case b) Relevant but supplementary information: The acute 96 hour-LC50 for zebrafish embryo after exposure to Roundup was determined to be 58.3 mg/L. Seven test concentrations between 3.5 and 350 mg/L were used with 4 replicates and 20 embryos each. It was stated that the test was performed based on OECD guideline 236. This study type has six validity criteria for the control group, including fertilization rate success (required ≥70% in batch tested), hatching rate at 96 hours (required ≥80%) and overall survival (required ≥90%). There is also a validity criteria requirement for the results of a positive control group, using 3, 4-dichloroaniline, to achieve a minimum of 30% mortality at 96 hours. There are also two water quality criteria relating to water temperature (required 26 ±1 ºC at any time during the test) and for dissolved oxygen at 96 hours to be > 80% of the saturation. Whilst dissolved oxygen levels at 6 mg O2/L were achieved in the test, the temperature was outside of the validity criteria limits, being maintained at 28 ±1 ºC for the study duration. Therefore the dissolved oxygen level cannot be confirmed as reporting of dissolved oxygen in terms of mg O2/L requires information on atmospheric pressure and temperature to resolve actual dissolved oxygen in terms of percentage saturation. A slight increase in temperature by a degree Celcius is not overly concerning,

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						however, it is difficult to conclude on the reliability of the study as only one other validity criteria is mentioned, with respect to control survival, with 2% mortality achieved in the controls. There is no information presented on the fertilization rate of the batch of eggs used, nor is there hatching rates presented for the controls or the treatment groups. In addition, the performance of the test system cannot be confirmed as the results of a positive control group were not included. In addition, there are no biological data for the treatment groups presented other than in figures, so the data in the figures cannot be confirmed. Furthermore, claims that the achieved LC50 of 58.3 mg/L is 15,000 times lower than that used in agriculture is not supported by corresponding surface water monitoring data. A final point is that the test concentrations in the test system were not analytically verified and therefore, exposure concentrations cannot be confirmed. The study is considered unreliable.
502	Panwen M. et al.	CA 8.2.8, CP 10.2.1	2013	Acute toxicity of pesticides glyphosate and paraquat on river snails	Siliao Yanjiu (2013) No. 11, pp. 44	5.4.1 case b) Relevant but supplementary information: The material and methods sections lack important information. The test organisms were not specified. Detailed information on preparation and application of test solution is missing. The tested concentrations and the exposure time were not reported in the material and methods. The test item is not specified. It is only stated that it contains 10 % active ingredient, but other ingredients are unknown. No control results are available. Furthermore, it is unclear whether the reported endpoints refer to the active substance or to the product. No analytical verification of test concentrations were performed. The study is considered unreliable.
503	Paradelo M. et al.	CA 7.1.3.1.1	2015	Prediction of the glyphosate sorption coefficient across two loamy agricultural fields	Geoderma (2015), Vol. 259-260, pp. 224	5.4.1 case b) Relevant but supplementary information: Study of 9 soil factors influencing glyphosate sorption in 2 different fields. Not related to an efate guideline, but supplementary information.
504	Pareja L. et al.	CA 6.10.1	2019	Evaluation of glyphosate and AMPA in honey by water extraction followed by ion chromatography mass spectrometry. A pilot monitoring study	Analytical methods (2019), Vol. 11, No. 16, pp. 2123	5.4.1 case b) Relevant but supplementary information: This is primarily an analytical method paper, but does include information on analysis of collected samples.
505	Park J-S. et al.	CA 5.9	2013	Incidence, etiology, and outcomes of rhabdomyolysis in a single terfiary referral center	Journal of Korean Medical Science (2013), Vol. 28, No. 8, pp. 1194	5.4.1 case b) Relevant but supplementary information: This article only mentions glyphosate in the reference section. One reference specifically discusses rhabdomyolysis with intramuscular injection of formulated glyphosate.
506	Park S. et al.	CA 5.9.5	2016	Concurrent Hemoperfusion and Hemodialysis in Patients with Acute Pesticide Intoxication.	Blood Purification (2016), Vol. 42, No. 4, pp. 329	5.4.1 case b) Relevant but supplementary information: This article describes the use of hemodialysis and hemoperfusion in pesticide overdoses. Out of 383 pesticide ingestions 110 were glyphosate formulations. Of the 80 deaths reported 12 of them were glyphosate. This article is describing a possibly beneficial modality of treating severe pesticide overdose and should not impact re-registration.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
507	Parks C. G. et al.	CA 5.9.4	2016	Rheumatoid Arthritis in Agricultural Health Study Spouses: Associations with Pesticides and Other Farm Exposures.	Environmental health perspectives (2016), Vol. 124, No. 11, pp. 1728	5.4.1 case b) Relevant but supplementary information: Lack of information about glyphosate frequency of use and timing of use. This publication is considered unreliable.
508	Parvez S. et al.	CA 5.9.4	2018	Glyphosate exposure in pregnancy and shortened gestational length: a prospective Indiana birth cohort study	Environmental Health (2018), Vol. 17, pp. 23/1	5.4.1 case b) Relevant but supplementary information: Small study. Uncertain exposure characterization. Premature births were 1 of 5 for those with glyphosate < LOD and 1 of 66 for those with glyphosate > LOD. This suggests no evidence of glyphosate being related to preterm birth. This publication is considered unreliable.
509	Pasini R. A. et al.	CA 8.3	2018	Comparative selectivity of herbicides used in wheat crop on the predators Chrysoperla externa and Eriopis connexa	Planta Daninha (2018), Vol. 36,pp. E018179968	5.4.1 case b) Relevant but supplementary information: In the material and methods section important information is missing. The test items were not adequately specified regarding the content of the active ingredient. It is unclear whether the given active ingredient concentration in the spray solution corresponds to the content of the active ingredient in the formulation. The test did not follow a specific test guideline, although the culturing of the insects was conducted according to recognised approaches. There were no validity criteria established and the performance of the assays was not assessed using a positive control substance. An endpoint that could be used in an ecotoxicology risk assessment was not established.
510	Paudel P. et al.	CA 7.2.1	2015	Birnessite-Catalyzed Degradation of Glyphosate: A Mechanistic Study Aided by Kinetics Batch Studies and NMR Spectroscopy.	Soil Science Society of America Journal (2015), Vol. 79, No. 3, pp. 815	5.4.1 case b) Relevant but supplementary information: No relevant information on environmental fate included but a new abiotic (birnessite) degradation of glyphosate is discussed.
511	Pereira P. C. et al.	CA 8.2.7	2019	Acute Toxicity of Herbicides and Sensibility of Aquatic Plant Wolffia brasiliensis as a Bioindicator Organism	Planta Daninha (2019), Vol. 37, pp. e019201636	5.4.1 case b) Relevant but supplementary information: This paper describes a non-standard aquatic plant ecotoxicity test for a non-EU native species, and is therefore difficult to relate to an EU level ecotox risk assessment. The formulation used is specific to aquatic applications that are not on the proposed GAP for the renewal.
512	Perry M. J. et al.	CA 5.9.4	2019	Historical evidence of glyphosate exposure from a US agricultural cohort	Environmental Health (2019), Vol. 18, No. 1, pp. 42	5.4.1 case b) Relevant but supplementary information: The study population, the sampling and the method of analysis along with its validation are not sufficiently documented. This publication is considered unreliable.
513	Petersen C. T. et al.	CA 7.1.4.3, CA 7.5	2011	Comments on "Transport modes and pathways of the strongly sorbing pesticides glyphosate and pendimethalin through structured drained soils".	Chemosphere (2011), Vol. 85, No. 9, pp. 1538	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, comment on Kjaer et al_2011, Chemosphere (2011), Vol. 84, No. 4, pp. 471-479.
514	Picetti E. et al.	CA 5.9.5	2017	Glyphosate ingestion causing multiple organ failure: A near-fatal case report.	Acta Biomedica (2017), Vol. 88, No. 4, pp. 533	5.4.1 case b) Relevant but supplementary information: This is a report about multi-organ failure after suicidal ingestion of formulated glyphosate and should not impact re-registration.
515	Pinto C. L. et al.	CA 5.8.3	2018	Identification of candidate reference chemicals for in vitro steroidogenesis assays	Toxicology In Vitro (2018), Vol. 47, pp. 103	5.4.1 case b) Relevant but supplementary information: review, secondary source.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
516	Piotrowicz-Cieslak A. I. et al.	CA 8.6	2010	Different Glyphosate Phytotoxicity of Seeds and Seedlings of Selected Plant Species.	Polish Journal of Environmental Studies (2010), Vol. 19, No. 1, pp. 123	5.4.1 case b) Relevant but supplementary information: Study to compare the effect of glyphosate on plant growth parameters of 6 plant species.
517	Planche V. et al.	CA 5.9.5	2019	Acute toxic limbic encephalopathy following glyphosate intoxication.	Neurology (2019), Vol. 92, No. 11, pp. 534	5.4.1 case b) Relevant but supplementary information: This article discusses the neurologic sequelae of glyphosate ingestion. Glyphosate cannot cross the blood brain barrier. It is not neurotoxic.
518	Plewis I.	CA 5.6.1	2019	Comment on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats.	Archives of toxicology (2019), Vol. 93, No. 1, pp. 207	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
519	Plewis I.	CA 5.6.1	2020	Comment on response from Milesi et al. to 'Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats'.	Archives of toxicology (2020), Vol. 94, pp. 351	5.4.1 case b) Relevant but supplementary information: Glyphosate based herbicide (54% glyphosate acid equivalents as the K salt) dosed to pregnant rats.
520	Pochron S. et al.	CA 8.4.1	2020	Glyphosate but not Roundup® harms earthworms (Eisenia fetida).	Chemosphere (2020), Vol. 241, pp. 125017	5.4.1 case b) Relevant but supplementary information: The study was not conducted to GLP. The test design does not correspond to a current test guideline for earthworms focusing on reproduction parameters and there is no endpoint for risk assessment. Only a single dose level was used in the test, which is equivalent to 19.7 kg/ha; substantially higher than the maximum proposed application rate of glyphosate for the renewal. There was no analytical confirmation of levels tested, so exposure cannot be confirmed.
521	Portier C. J. et al.	CA 5.5	2017	Re: Tarazona et al. (2017): Glyphosate toxicity and carcinogenicity: a review of the scientific basis of the European Union assessment and its differences with IARC.	Archives of toxicology (2017), Vol. 91, No. 9, pp. 3195	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, ref to Tarazona et al._2017, Archives of toxicology (2017), Vol. 91, No. 8, pp. 2723-2743.
522	Poulsen M. E. et al.	CA 6.9	2017	Results from the Danish monitoring programme for pesticide residues from the period 2004-2011	Food Control (2017), Vol. 74, pp. 25	5.4.1 case b) Relevant but supplementary information: Summary of EU monitoring data.
523	Prevot-D'Alvise N. et al.	CA 8.2.1	2013	Acute toxicity of a commercial glyphosate formulation on European sea bass juveniles (Dicentrarchus labrax L.): gene expressions of heme oxygenase-1 (ho-1), acetylcholinesterase (AChE) and aromatases (cyp19a and cyp19b).	Cellular and molecular biology (2013), Vol. 59 Suppl, pp. OL1906	5.4.1 case b) Relevant but supplementary information: Test item was appropriately identified as being linked to the representative formulation. Test design does not however follow a recognised approach, uneven sample sizes and large fish were exposed. The rationale behind test concentration selection was not clear and dose preparation was unclear as exposure rates could not be confirmed. Effects of acetone on fish were not discussed. Endpoints anyway demonstrate low toxicity compared to existing list of endpoints.
524	Puertolas L. et al.	CA 8.2	2010	Evaluation of side-effects of glyphosate mediated control of giant reed (Arundo donax) on the structure and function of a nearby Mediterranean river ecosystem.	Environmental research (2010), Vol. 110, No. 6, pp. 556	5.4.1 case b) Relevant but supplementary information: The effect of the herbicide Herbolex (mixture of glyphosate isopropyl amine salts and surfactant compounds) on the structure and function of a nearby river ecosystem after application of glyphosate in the riparian vegetation was evaluated. Therefore, in situ bioassays with

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						transplanted Daphnia magna, field collected caddis fly (Hydropsyche exocellata) and benthic macroinvertebrate structure and function were investigated. The structure of the benthic macroinvertebrate assemblages was assessed at the same time as well as two additional time-points before application (5 and two month before). Transplants with Daphnia magna were deployed at the day of application and 12 days afterwards, whereas Hydropsyche exocellata samples were collected at the day of application and 3 days afterwards. Concentration of glyphosate and the metabolite AMPA was analysed in the river water samples collected from the studied sites at the day of application and two, three and 12 days afterwards. But other chemicals were not analysed. The herbicide was applied at 2.1 kg glyphosate/ha in an area of 0.5 ha of riparian forest, but the exact place is not specified. Furthermore, no data on the weather conditions were collected which may have had an influence on the community structure. No exact biological data regarding the macroinvertebrate abundance is reported. However, as no results were reported in values reflecting agreed endpoints for the ecological risk assessment and the information is insufficient to transfer values in such endpoints, the study can be considered as supportive information only.
525	Puglis H. J. et al.	CA 8.1.4	2011	Effects of Technical-Grade Active Ingredient vs. Commercial Formulation of Seven Pesticides in the Presence or Absence of UV Radiation on Survival of Green Frog Tadpoles	Archives of Environmental Contamination and Toxicology (2011), Vol. 60, No. 1, pp. 145	5.4.1 case b) Relevant but supplementary information: Conducted in the US, compares glyphosate a.i. and glyphosate product (and others). Study looks at toxicity to green frog tadpoles (collected from local pond and kept in aged tap water) and impact of UV radiation to see if it enhances toxicity. Application up to 5 mg/L. Findings difficult to extrapolate to the regulatory risk assessment of glyphosate.
526	Qin J. et al.	CA 7.2.1.1	2017	Potential effects of rainwater-borne H2O2 on competitive degradation of herbicides and in the presence of humic acid.	Chemosphere (2017), Vol. 170, pp. 146	5.4.1 case b) Relevant but supplementary information: Provides information on degradation of glyphosate in the presence of hydrogen peroxide, Fe2+, and humic acid and the presence of another pesticide simulating conditions found in natural waters.
527	Quaglia G. et al.	CA 7.5	2019	A spatial approach to identify priority areas for pesticide pollution mitigation	JOURNAL OF ENVIRONMENTAL MANAGEMENT (2019), Vol. 246, pp. 5833	5.4.1 case b) Relevant but supplementary information: This paper describes a modeling approach to assess potential risk of glyphosate loads in waterbodies but does not utilize or report measured glyphosate concentrations. Provides supplemental information but not directly relevant for glyphosate EU risk assessment.
528	Rahman F. et al.	CA 8.9	2019	Evaluation of Glyphosate Levels in Sediments of Milky Stork Foraging Areas in Kuala Gula Bird Sanctuary, Perak, Malaysia.	Pertanika Journal of Tropical Agricultural Science (2019), Vol. 42, No. 3, pp. 995	5.4.1 case b) Relevant but supplementary information: Considered relevant but supplemental as this relates to biodiversity irrespective of not deriving from an EU country.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
529	Rahnama R. et al.	CA 8.2.1	2018	Acute toxicity of herbicides on the survival of adult shrimp, Artemia Franciscana	Iranian Journal of Toxicology (2018), Vol. 12, No. 6, pp. 45	5.4.1 case b) Relevant but supplementary information: Important information is missing in the material and methods section. The preparation and application of the test solutions was not reported. The test item is not adequately specified. The given purity of 41 % indicates that a product was tested. However, it is not clear whether the test concentrations refer to the product or to the active substance. In addition, the biological results of the test were not sufficiently stated. The endpoint data presented in the paper is difficult to understand. Table 3 in the article indicates a 48 hour LC50 of 17.483 mg/L, whilst in Figure 2, the 48 hour LC50 is 38.897 mg/L. Therefore, the reliability of the data presented in the article is questionable. In addition, it is unclear whether the animals were fed during the assay. Figure 3 appears to show artemia with egg bags and highlights the contents of the rudimentary artemia gut as being those exposed to herbicides. This observation is not supported by any information presented in the paper. No mortality data for the test concentrations nor for the controls is presented to evaluate the results. Assessment of the statistical power of the assay is not possible. Furthermore, there was no analytical verification of test concentrations reported, there is no guideline stated and it is non GLP. Multiple doses were tested, but a positive control group was not included, so the performance / robustness of the test system cannot be confirmed. The study is considered unreliable.
530	Raimets R. et al.	CA 6.10.1	2020	Pesticide residues in beehive matrices are dependent on collection time and matrix type but independent of proportion of foraged oilseed rape and agricultural land in foraging territory	Chemosphere (2020), Vol. 238, pp. 124555	5.4.1 case b) Relevant but supplementary information: The data are over-summarized. Only the percentage of samples with detectable / quantifiable residues, the median and the maximum residues are provided and it is not clear how many samples were analysed. Furthermore, it seems that the same data were already published (with more details) in a previous article (Karise R. et al., 2017). Therefore, the publication is considered to only provide supplementary information that is not directly relevant to MRL setting and risk assessment.
531	Rainio M. J. et al.	CA 8.3.2, CP 10.3.2	2019	Effects of a glyphosate-based herbicide on survival and oxidative status of a non-target herbivore, the Colorado potato beetle (Leptinotarsa decemlineata)	Comparative biochemistry and physiology. Toxicology & pharmacology (2019), Vol. 215, pp. 47	5.4.1 case b) Relevant but supplementary information: The material and methods section lacks some important information. Newly hatched larvae from field collected beetles were used, however information on previous exposure to other chemicals or field history was not documented. Information on replicates, loading per replicate and test conditions were not reported. The preparation of the test solution was not specified. The test approach used does not follow a recognised test guideline and the rationale for the route of exposure and the dosing volumes used, is not described. The author indicates that a 100% Roundup Bio exposure in nature is unlikely to occur and that the high concentration mainly tests the physiological limits of the system including the antioxidant enzyme capacity of the beetles

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						against the product. Exposure levels where significant effects were observed are unrealistic highlighting. There was no analytical verification, and the study was not performed according to GLP. Furthermore, endpoints based on biochemical analyses of larval homogenates cannot be applied in regulatory risk ecotoxicology assessment of non-target arthropods. Given the unrealistically high exposure levels used in the study, the non-guideline approach and the uncertainties as identified above, the study is considered as supplementary only.
532	Rampazzo N. et al.	CA 7.1.2.2.1	2013	Adsorption of glyphosate and aminomethylphosphonic acid in soils.	International Agrophysics (2013), Vol. 27, No. 2, pp. 203	5.4.1 case b) Relevant but supplementary information: The study investigates glyphosate and AMPA adsorption to 3 different soils. Iron-oxides appear to play an important role in adsorption of glyphosate and AMPA in these soils.
533	Ranganathaswamy M. et al.	CA 8.7	2012	Evaluation of toxicity of agrochemicals on Trichoderma isolates in vitro.	Journal of Biological Control (2012), Vol. 26, No. 4, pp. 391	5.4.1 case b) Relevant but supplementary information: The form of glyphosate used in the experiments cannot be confirmed. Fungal growth inhibition is not part of the specific ecotox risk assessment for the renewal.
534	Razi M. et al.	CA 5.8.2	2012	Histological and histochemical effects of Gly-phosate on testicular tissue and function.	Iranian Journal of Reproductive Medicine (2012), Vol. 10, No. 3, pp. 181	5.4.1 case b) Relevant but supplementary information: No internationally accepted methods were used, only one dose level was considered, there was no characterisation of the test compound and the results are not corroborated by regulatory reproductive toxicity studies using much higher dose levels and longer times of exposure. This publication is considered unreliable.
535	Rebai O. et al.	CA 5.3	2017	Morus alba leaf extract mediates neuroprotection against glyphosate-induced toxicity and biochemical alterations in the brain.	Environmental science and pollution research international (2017), Vol. 24, No. 10, pp. 9605	5.4.1 case b) Relevant but supplementary information: Formulation administered via i.p. injection (described as a commercial formulation registered in the Tunisian Ministry of Agriculture).
536	Reding M.-A.	CA 7.5	2012	Letter to the editor regarding "Determination of glyphosate in groundwater samples using an ultrasensitive immunoassay and confirmation by on-line solid phase extraction followed by liquid chromatography coupled to tandem mass spectrometry".	Analytical and bioanalytical chemistry (2012), Vol. 404, No. 2, pp. 613	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, comments on Sanchis et al_2011, Analytical and bioanalytical chemistry (2012), Vol. 402, No. 7, pp. 2335-45.
537	Ren X. et al.	CA 5.8.2	2018	Effects of glyphosate on the ovarian function of pregnant mice, the secretion of hormones and the sex ratio of their fetuses.	Environmental pollution (2018), Vol. 243, No. Pt B, pp. 833	5.4.1 case b) Relevant but supplementary information: Glyphosate purity not reported. Only one dose level for glyphosate was tested (0.5% solution added to drinking water (it is unclear what actual dose was administered per day)). The number of animals used per dose level was too low. Insufficient information is given on the biochemical methods used. This publication is considered unreliable.

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538	Rendon-von Osten J. et al.	CA 5.9.2	2017	Glyphosate Residues in Groundwater, Drinking Water and Urine of Subsistence Farmers from Intensive Agriculture Localities: A Survey in Hopelchen, Campeche, Mexico.	International journal of environmental research and public health (2017), Vol. 14, No. 6, pp. E595	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.
539	Reno U. et al.	CA 8.2.4	2016	EFECTOS SUBLETALES DE CUATRO FORMULACIONES DE GLIFOSATO SOBRE Daphnia magna Y Ceriodaphnia dubia (CRUST ACEA, CLADOCERA)	Natura Neotropicalis (2016), Vol. 47, No. 1, pp. 7	5.4.1 case b) Relevant but supplementary information: The aim of the study was to compare the chronic toxicity of four different commercially available glyphosate products to Daphnia magna and Ceriodaphnia dubia. The study was not conducted according to GLP and the study design lacks some details compared with relevant guidelines. The test concentrations are based on nominal and no analytical verification of test item concentrations were conducted (only analysis of stock solutions using an unspecific detector). Although the details of the statistical analyses are reported, the study report only describes where significant differences were found. No detailed results including standard deviations of the investigated parameters are provided. As the study is based on different glyphosate products, the toxicity of glyphosate active substance alone is unknown and therefore endpoints generated from this study are not quantifiable and deliver only supplementary information.
540	Resnik D. B.	CA 5.5	2015	Retracting Inconclusive Research: Lessons from the Seralini GM Maize Feeding Study	Journal of agricultural & environmental ethics (2015), Vol. 28, No. 4, pp. 621	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted
541	Richards B. K. et al.	CA 7.1.4	2018	Antecedent and Post-Application Rain Events Trigger Glyphosate Transport from Runoff-Prone Soils	Environmental science & technology letters (2018), Vol. 5, No. 5, pp. 249	5.4.1 case b) Relevant but supplementary information: Run-off study in New York State, USA. The proposed soil hydrologic condition in 7 days pre-spraying is important in determining degree of runoff. Conclusion from study of interest even though data not appropriate for EU risk assessment.
542	Roberts D. M. et al.	CA 5.9	2010	A prospective observational study of the clinical toxicology of glyphosate-containing herbicides in adults with acute self-poisoning.	Clinical toxicology (2010), Vol. 48, No. 2, pp. 129	5.4.1 case b) Relevant but supplementary information: This paper is a prospective study of outcomes of suicidal ingestions of glyphosate based herbicides. It shows that the mortality rate from overdose is 3.2%. This paper supports the idea that low-toxicity pesticides have a lower mortality rate than higher toxicity products.
543	Rodrigues H. G. et al.	CA 5.4	2011	Effects of roundup pesticide on the stability of human erythrocyte membranes and micronuclei frequency in bone marrow cells of Swiss mice	Open Biology Journal (2011), Vol. 4, pp. 54	5.4.1 case b) Relevant but supplementary information: Substance identification is missing, the study is lacking statistically and moreover, a mixed study design has been presented where the micronuclei frequency had been investigated in mice after i.p. injection.
544	Rose M. T. et al.	CA 8.4.2	2018	Minor effects of herbicides on microbial activity in agricultural soils are detected by N-transformation but not enzyme activity assays	European journal of soil biology (2018), Vol. 87, pp. 72	5.4.1 case b) Relevant but supplementary information: Non-EU soil but relevant endpoints demonstarting a lack of effects on soil microbial populations (n-trans) at field application rates.

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545	Rother H.	CA 5.9.5	2012	Improving poisoning diagnosis and surveillance of street pesticides	SAMJ (2012), Vol. 102, No. 6, Special Iss., pp. 485	5.4.1 case b) Relevant but supplementary information: No new information included.
546	Ruamthum W. et al.	CA 8.1.4	2011	Effect of glyphosate-based herbicide on acetylcholinesterase activity in tadpoles, Hoplobatrachus rugulosus.	Communications in agricultural and applied biological sciences (2011), Vol. 76, No. 4, pp. 923	5.4.1 case b) Relevant but supplementary information: Conducted in Thailand. Study to look at effect of glyphosate on enzyme activity in tadpoles (east asian bullfrog). 96 hr exposure. LC50 values generated.
547	Ruiz-Gonzalez E. L. et al.	CA 8.2.4	2018	Assessment of median lethal concentration (CL50) of pollutants on Macrobrachium tenellum juveniles	Latin American Journal of Aquatic Research (2018), Vol. 46, No. 3, pp. 589	5.4.1 case b) Relevant but supplementary information: Considered supplementary as the test substance cannot be explicitly identified. Information presented suggests that this is not the representative formulation for the renewal as it is based on the potassium salt of glyphosate.
548	Rzymski P. et al.	CA 8.2.7	2013	The effect of glyphosate-based herbicide on aquatic organisms - a case study.	Limnological Review (2013), Vol. 13, No. 4, pp. 215	5.4.1 case b) Relevant but supplementary information: Information may be relevant to the wider discussion on trophic interactions, but cannot be related to the EU level ecotox risk assessment for the renewal.
549	Sadeghi A. et al.	CA 8.2.1	2014	Investigation of LC50, NOEC and LOEC of glyphosate, deltamethrin and pretilachlor in guppies (Poecilia reticulata)	Iranian Journal of Toxicology (2014), Vol. 8, No. 26, pp. 1124	5.4.1 case b) Relevant but supplementary information: Study was considered to be conducted according to a recognised guideline via the cited reference in the paper, but the test system specifics cannot be confirmed. For example, there are validity criteria stated but water qualities / environmental conditions are not presented, so the suitability of the test system cannot be confirmed. Additionally, there was no analytical verification of the exposure concentrations, so exposure cannot be confirmed. The source and age / size of the fish are not presented in the paper, so the appropriateness of the test system cannot be confirmed. Additionally, the size of the aquariums used is stated (120 L) but the volume of test or control medium in these vessels is not stated, therefore fish loading rates cannot be determined. The test substance is identified as a 'commercial 41% glyphosate' – no other information are presented so effects cannot clearly be related to the active substance glyphosate, and the relevance of the test item used to the EU renewal of MON 52276 cannot be confirmed. The study is considered unreliable.
550	Sagliker H. A.	CA 7.1.2.1.1	2018	Carbon mineralisation in orange grove soils treated with different doses of glyphosate-amine salt	Journal of Environmental Protection and Ecology (2018), Vol. 19, No. 3, pp. 1102	5.4.1 case b) Relevant but supplementary information: Study demonstrates that glyphosate application at up to 4x recommended rates does not decrease carbon mineralisation in soil and in some cases increases carbon mineralisation. Data is supplementary of previously reported work.
551	Sakpa C. L. et al.	CA 5.6	2018	Effects of glyphosate on sperm parameters and pregnancy success rate in Wistar rats.	Annals of Biomedical Sciences (2018), Vol. 17, No. 2, pp. 156	5.4.1 case b) Relevant but supplementary information: The glyphosate used is not sufficiently characterized, only two dose levels were tested and the number of animals used per dose level was too low. This publication is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
552	Salgado T. P. et al.	CA 8.6.2	2011	Initial symptoms of Eucalyptus intoxication by glyphosate rates applied on the stem or leaves. Sintomas da intoxicacao inicial de Eucalyptus proporcionados por subdoses de glyphosate aplicadas no caule ou nas folhas.	Planta Daninha (2011), Vol. 29, No. 4, pp. 913	5.4.1 case b) Relevant but supplementary information: Effects on eucalyptus seedlings after application of glyphosate (Roundup Original, 360 g a.e./L). Spraying the aerial part of the plants (trials 3 and 4). Plant BBCH stage unclear (hight at start of application: 40/ 69 cm). No biological results for control or any test concentration reported in tables. Therefore the results cannot be reproduced. No results in values which can be used for the risk assessment.
553	Saltmiras D. A. et al.	CA 5.8	2015	Glyphosate: The Fate and Toxicology of a Herbicidal Amino Acid Derivative.	Amino Acids in Higher Plants (2015), pp. 461	5.4.1 case b) Relevant but supplementary information: Overview of glyphosate toxicology and fate data.
554	Samal S. et al.	CA 8.5	2019	Evaluating the effect of monocrotophos and glyphosate on microbial population and certain important exoenzyme activities in soil.	Journal of Environmental Biology (2019), Vol. 40, No. 2, pp. 226	5.4.1 case b) Relevant but supplementary information: Dosing information / purity of both active substances cannot be confirmed. Study not conducted according to a recognised guideline. Presented endpoints not relateable to an EU level risk assessment based on lack of soil characterisation.
555	Santadino M. et al.	CA 8.4.1	2014	Glyphosate Sublethal Effects on the Population Dynamics of the Earthworm Eisenia fetida (Savigny, 1826)	Water, air, and soil pollution (2014), Vol. 225, No. 12, pp. 2207	5.4.1 case b) Relevant but supplementary information: The chronic laboratory study with E. fetida was not performed according to a recommended guideline and thus, no validity criteria were given. Insufficient information is provided on the experimental design, as no information on the soil characteristics and the application of the test item is given. Only two test item treatment rates, without giving any rationale for choosing the higher dose, and a negative control were tested, but no positive control. No information on underlying raw data is given, i.e. number of control mortality, number of juveniles and cocoons etc. Finally, there are no quantifiable endpoints presented in the paper, considered applicable to an EU level ecotoxicological risk assessment for renewal purposes.
556	Santos M. J. G. et al.	CA 8.4, CP 10.4.2.2	2012	Pesticide application to agricultural fields: effects on the reproduction and avoidance behaviour of Folsomia candida and Eisenia andrei.	Ecotoxicology (2012), Vol. 21, No. 8, pp. 2113	5.4.1 case b) Relevant but supplementary information: The study is well described and performed according to ISO guidelines. Validity criteria were met, where relevant. Glyphosate did not seem to affect either earthworms or collembolans at the recommended field dose; therefore there were no endpoints presented in the paper, thus the study is considered supplementary only.
557	Santos R. et al.	CA 5.9.4	2019	Thyroid and reproductive hormones in relation to pesticide use in an agricultural population in Southern Brazil	Environmental Research (2019), Vol. 173, pp. 221	5.4.1 case b) Relevant but supplementary information: Insufficient information is provided on the biochemical methods used. No detailed description of the analytical methods for the measurement of hormones in serum (using a kit from Roche). This publication is considered unreliable.

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558	Saska P. et al.	CA 8.2.1	2017	Treating Prey With Glyphosate Does Not Alter the Demographic Parameters and Predation of the Harmonia axyridis (Coleoptera: Coccinellidae).	Journal of economic entomology (2017), Vol. 110, No. 2, pp. 392	5.4.1 case b) Relevant but supplementary information: Exposure was performed via treated prey, which does not correspond to an adequate route of exposure regarding current test guideline for non-target-arthropods. 2 mL test solution was applied to 50 aphids placed on a filter paper in a petri dish, (dimension unknown). There is no analytical verification, and the study does not conform to guidelines nor GLP. The study is well documented, but no endpoints could be derived which can be applied for the risk assessment. Therefore, the study is considered as supplementary only.
559	Saska P. et al.	CA 8.3	2016	Treatment by glyphosate-based herbicide alters life history parameters of the rose-grain aphid Metopolophium dirhodum.	Scientific reports (2016), Vol. 6, pp. 27801	5.4.1 case b) Relevant but supplementary information: The paper does not present endpoints that could be used in an EU level ecotox risk assessment.
560	Sato C. et al.	CA 5.9	2011	Aseptic meningitis in association with glyphosate-surfactant herbicide poisoning.	Clinical toxicology (2011), Vol. 49, No. 2, pp. 118	5.4.1 case b) Relevant but supplementary information: This article evaluates the case of a woman who presented in multi-organ failure 2 days after a formulated glyphosate overdose. Meningitis was suspected and the patient was found to have a high level of glyphosate in CSF. The claim is that glyphosate can cause aseptic meningitis and neurotoxicity. Glyphosate is hydrophilic and cannot cross cell membranes without active transport. It is well known that hypoxia and inflammatory changes can disrupt the tight junctions of the blood brain barrier which may allow passage of substances into the CSF. IL-6 is a known marker of inflammation. This is perhaps the mechanism through which they were able to measure glyphosate in the CSF. Since this paper is about a suicidal ingestion it should have no impact on re-registration.
561	Schinasi L. et al.	CA 5.5	2014	Non-Hodgkin lymphoma and occupational exposure to agricultural pesticide chemical groups and active ingredients: a systematic review and meta-analysis.	International journal of environmental research and public health (2014), Vol. 11, No. 4, pp. 4449	5.4.1 case b) Relevant but supplementary information: This paper concerns a meta-analysis where the results were taken from available studies at face value. The authors had no way to correct for recall bias, confounding, etc. As the meta-RRs of the studies included are in error the meta-analyses are also in error. The study is considered unreliable.
562	Schwan-Stoffel A. V. et al.	CA 8.6	2012	The effect of herbicides on the germination of urediniospores of Phakopsora Pachyrhizi SYD. & P. SYD. Original Title: Germinacao de Phakopsora Pachyrhizi SID. & P. SID. Sob diferentes herbicidas.	Arquivos do Instituto Biologico Sao Paulo (2012), Vol. 79, No. 3, pp. 381	5.4.1 case b) Relevant but supplementary information: Study describes the impacts of glyphosate on germination of plant pathogen spores.
563	Seok S-J. et al.	CA 5.9	2011	Surfactant volume is an essential element in human toxicity in acute glyphosate herbicide intoxication.	Clinical toxicology (2011), Vol. 49, No. 10, pp. 892	5.4.1 case b) Relevant but supplementary information: Results indicate that treatment of patients with acute glyphosate herbicide intoxication should take into account the volume and not the type of surfactants in herbicide formulations.
564	Seralini G-E. et al.	CA 5.5	2013	Answers to critics: Why there is a long term toxicity due to a Roundup-tolerant genetically modified maize and to a Roundup herbicide	Food and Chemical Toxicology (2013), Vol. 53, pp. 476	5.4.1 case b) Relevant but supplementary information: Author responding to multiple Letters to the Editor.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
565	Shaw G. M. et al.	CA 5.9	2014	Early pregnancy agricultural pesticide exposures and risk of gastroschisis among offspring in the San Joaquin Valley of California	Birth Defects Research, Part A: Clinical and Molecular Teratology (2014), Vol. 100, No. 9, pp. 686	5.4.1 case b) Relevant but supplementary information: No new information without clear relevance for the risk assessment.
566	Shaw W.	CA 5.9	2017	Elevated Urinary Glyphosate and Clostridia Metabolites With Altered Dopamine Metabolism in Triplets With Autistic Spectrum Disorder or Suspected Seizure Disorder: A Case Study.	Integrative medicine (2017), Vol. 16, No. 1, pp. 50	5.4.1 case b) Relevant but supplementary information: This is a limited case study of 3 individuals, with minimal data on glyphosate exposure.
567	Shiogiri N. S. et al.	CA 8.2	2010	Ecotoxicity of glyphosate and aterbane (R) br surfactant on guaru (Phalloceros caudimaculatus).	Acta Scientiarum Biological Sciences (2010), Vol. 32, No. 3, pp. 285	5.4.1 case b) Relevant but supplementary information: Conducted in Brazil, looking at comparison of toxicity of glyphosate products with different amounts of surfactant to different fish species and impact on electrical conductivity, dissolved oxygen and pH.
568	Shrestha S. et al.	CA 5.9.2	2018	Incident thyroid disease in female spouses of private pesticide applicators.	Environment International (2018), Vol. 118, pp. 282	5.4.1 case b) Relevant but supplementary information: Very superficial information about exposure to specific pesticides. Limitations in assessment of potential confounding factors. Limitations in exposure and outcome information. This publication is considered unreliable.
569	Shrestha S. et al.	CA 5.9.4	2018	Pesticide use and incident hypothyroidism in pesticide applicators in the agricultural health study	Environmental Health Perspectives (2018), Vol. 126, No. 9, pp. 11	5.4.1 case b) Relevant but supplementary information: Self-reported outcomes, lack of biological predicate for many pesticides (including glyphosate), and failure to control for confounding by other pesticides for glyphosate and for other pesticides. This publication is considered unreliable.
570	Siddhapara M. R. et al.	CP 10.3.2	2012	Toxicity of some commonly used insecticides/herbicides on Zygogramma bicolorata Pallister (Coleoptera: Chrysomelidae).	Journal of Biological Control (2012), Vol. 26, No. 3, pp. 251	5.4.1 case b) Relevant but supplementary information: The source of the beetles used was not adequately described. The source and purity of the glyphosate test substance was not described, preventing confirmation ofthe exposure concentrations used in the test. There was insufficient description of the test system to enable comparison with existing test guidelines to establish acceptability of the approach used. Analytical verification of the exposure concentrations was not performed. No endpoint can be derived from the study. The sudy is considered as supplementary only.
571	Sihtmaee M. et al.	CA 8.2.4.1, CA 8.6, CA 8.7	2013	Ecotoxicological effects of different glyphosate formulations	Applied soil ecology (2013), Vol. 72, pp. 215	5.4.1 case b) Relevant but supplementary information: The study design and overall conduct were well described. The D. magna toxicity test was performed according to OECD guideline 202 but validity criteria were not mentioned. Analytical verification of the test materials and exposure concentrations within the study was also lacking. Overall, the study is considered to be of limited relevance to the EU annex renewal of glyphosate as the D. magna toxicity test was only a small part of the study, and the soil portion of the study was conducted using exaggerated soil concentrations (up to 1000 times relevant levels). For these reasons, the study is considered supplemental only.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
572	Silva V. et al.	CA 7.5	2019	Pesticide residues in European agricultural soils - A hidden reality unfolded	Science of the total environment (2019), Vol. 653, pp. 1532	5.4.1 case b) Relevant but supplementary information: Analysis for glyphosate & AMPA and other pesticides in 317 soil samples from 11 EU countries. Provides inidcation of residues but no use history.
573	Singh B. et al.	CA 7.1.3.1.1	2014	Soil characteristics and herbicide sorption coefficients in 140 soil profiles of two irregular undulating to hummocky terrains of western Canada	Geoderma (2014), Vol. 232-234, pp. 107	5.4.1 case b) Relevant but supplementary information: Soil adsoption data for glyphosate are reported but they are well within the numbers reported in the dossier.
574	Skeff W. et al.	CA 7.5	2015	Glyphosate and AMPA in the estuaries of the Baltic Sea method optimization and field study.	Marine pollution bulletin (2015), Vol. 100, No. 1, pp. 577	5.4.1 case b) Relevant but supplementary information: Provides optimized analytical method and surface water monitoring results for 10 estuaries along the Baltic Sea in Germany.
575	Skretteberg L. G. et al.	CA 6.9	2015	Pesticide residues in food of plant origin from Southeast Asia - A Nordic project	Food Control (2015), Vol. 51, pp. 225	5.4.1 case b) Relevant but supplementary information: Monitoring data that may be relevant to the actual exposure of EU consumers to glyphosate residues. But non EU data, therefore, not directly linked to the representative uses.
576	Slager R. E. et al.	CA 5.9.4	2010	Rhinitis associated with pesticide use among private pesticide applicators in the agricultural health study	Journal of Toxicology and Environmental Health - Part A: Current Issues (2010), Vol. 73, No. 20, pp. 1382	5.4.1 case b) Relevant but supplementary information: No information on the formulations, farming practice in the given time period has been provided.
577	Slomberg D. L. et al.	CA 7.5	2017	Insights into natural organic matter and pesticide characterisation and distribution in the Rhone River.	Environmental Chemistry (2017), Vol. 14, No. 1, pp. 64	5.4.1 case b) Relevant but supplementary information: Supplementary information on glyphosate detection in surface water.
578	Smpokou E. et al.	CA 5.9.4	2019	Environmental exposures in young adults with declining kidney function in a population at risk of Mesoamerican nephropathy.	Occupational and environmental medicine (2019), Vol. 76, No. 12, pp. 920	5.4.1 case b) Relevant but supplementary information: Too little glyphosate exposure for an informative study. Many confounding exposures. Although this was described as a case control study, the authors did not calculate odds ratios. Evaluation of mean values is not a causal parameter in a case control study. This publication is considered unreliable.
579	Solomon K. R.	CA 5.5	2017	What is the problem with glyphosate?	Outlooks on Pest Management (2017), Vol. 28, No. 4, pp. 173	5.4.1 case b) Relevant but supplementary information: Review of IARC deficiencies.
580	Solomon K. R.	CA 5.9.2	2016	Glyphosate in the general population and in applicators: a critical review of studies on exposures.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 21	5.4.1 case b) Relevant but supplementary information: review, secondary source.
581	Solomon K.R.	CA 5.5	2018	Corrigendum to: Glyphosate in the general population and in applicators: a critical review of studies on exposures.	Critical Reviews in Toxicology (2018), Vol 48, No 10, pp. 896	5.4.1 case b) Relevant but supplementary information: Corrigendum to Solomon et al._2016, Critical Reviews in Toxicology (2016), 46, sup1, pp. 21-27.
582	Song H.	CA 8.2	2010	Toxic action of acetamiprid, glyphosate and their combined pollution on Hydra magnipapillata	Anhui Nongye Kexue (2010), Vol. 38, No. 20, pp. 10811	5.4.1 case b) Relevant but supplementary information: Test species (freshwater polyp) collected from a rural pond in China. It is not clear what previous exposure the test species may have had to pesticides. It is not clear if the glyphosate is technical grade or product; the concentrations are from 0.14 to 36 mg/L.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
583	Song H. et al.	CA 8.2	2010	The Single and Binary-Combined Acute Toxicities of Five Common Pesticides on Hydra Magnipapillata	Journal of Anhui Normal University (Natural Science) (2010), Vol. 33, no. 2, pp. 159	5.4.1 case b) Relevant but supplementary information: Test species (freshwater polyp) collected from rural pond in China, it is not clear what exposure the test species may have had to pesticides or other chemicals previously. It is not clear if the glyphosate is technical material or product; the concentrations are from 40 to 227 mg/L.
584	Song H-Y. et al.	CA 5.8	2012	In vitro cytotoxic effect of glyphosate mixture containing surfactants.	Journal of Korean medical science (2012), Vol. 27, No. 7, pp. 711	5.4.1 case b) Relevant but supplementary information: In vitro mixture effects only, not glyphosate alone.
585	Sorahan T.	CA 5.5	2016	Visualising and thinking and interpreting. Response to the Burstyn and de Ros comments on Sorahan "Multiple myeloma and glyphosate use: A re-analysis of us agricultural health study (AHS) data".	International Journal of Environmental Research and Public Health (2016), Vol. 14, No. 1, pp. E6	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Response to Burstyn et al. on Sorahan et al._2015, Int. J. Environ. Res. Public Health (2015), Vol. 12, pp. 1548-1559.
586	Sribanditmongkol P. et al.	CA 5.9.5	2012	Pathological and toxicological findings in glyphosate-surfactant herbicide fatality: a case report.	The American journal of forensic medicine and pathology (2012), Vol. 33, No. 3, pp. 234	5.4.1 case b) Relevant but supplementary information: Description of a case of poisoning / suicidal ingestions of formulated glyphosate cause caustic injury, it is not unusual to find ulceration and haemorrhage of the GI tract in lethal ingestions.
587	Sritana N. et al.	CA 5.8.3	2018	Glyphosate induces growth of estrogen receptor alpha positive cholangiocarcinoma cells via non-genomic estrogen receptor/ERK1/2 signaling pathway.	Food and chemical toxicology (2018), Vol. 118, pp. 595	5.4.1 case b) Relevant but supplementary information: The results showed that glyphosate has the same potency as Estradiol (E2) when tested at extremely low concentrations.This has not been corroborated by other ED studies. This publication is considered unreliable.
588	Staufer P. et al.	CA 7.5	2012	Diffuse inflow from settlements	Aqua & Gas (2012), Vol. 92, No. 11, pp. 42	5.4.1 case b) Relevant but supplementary information: Describes modeling to predict contamination of 4 chemicals (one of which is glyphosate) in rainfall runoff and stormwater overflow discharge from WWTP outflow. Evaluates results at both the local and the Rhein River scale.
589	Stecca C. S. et al.	CA 8.3	2016	Side-Effects of Glyphosate to the Parasitoid Telenomus remus Nixon (Hymenoptera: Platygastridae).	Neotropical entomology (2016), Vol. 45, No. 2, pp. 192	5.4.1 case b) Relevant but supplementary information: The study was conducted in accordance with the protocols proposed by IOBC. Exposure via overspray on egg-cards and parasitoid pupae does not correspond to an adequate route of exposure according to current guidelines for testing non-target arthopods. The test design for the bioassay where adults are exposed to dry residues moderately described. The mortality of parasitoids during exposure is unclear, however, the spray deposit is given. The assessment of the biological endpoints in not precisely reported; day of emergence of parasitoids is not given. As the biological data do not report results in values useful for the risk assessment, there is no analytical verification, and the study is non GLP, the study can be considered as supplementary only.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
590	Stellin F. et al.	CA 8.4.1	2017	Effects of different concentrations of glyphosate (Roundup 360A®) on earthworms (Octodrilus complanatus, Lumbricus terrestris and Aporrectodea caliginosa) in vineyards in the North-East of Italy	Applied soil ecology (2018), Vol. 123, pp 802	5.4.1 case b) Relevant but supplementary information: The study has not been conducted according to a recognized test guideline and there are no validity criteria presented. There is no information on the choice of test duration and the experimental design is not sufficiently described. A formulation was tested, but no information is given on the set-up of the spray solution, how application was carried out and at which volume. For the soil sampling, the time point of sampling is not stated and no information on storage conditions of the soil prior to use in the study is given. Additionally, information on the soil depth in the experimental test containers is not mentioned. Similarly no information on food and environmental conditions during the exposure period (e.g. temperature, soil moisture, light conditions) are available. Finally, there are no quantifiable endpoints presented in the paper.
591	Stephenson C. L. et al.	CA 6.9	2016	An assessment of dietary exposure to glyphosate using refined deterministic and probabilistic methods.	Food and chemical toxicology (2016), Vol. 95, pp. 28	5.4.1 case b) Relevant but supplementary information: Refined dietary risk assessment.
592	Stipicevic S.	CA 5.5	2017	Some organophosphate insecticides and herbicides	Arhiv Za Higijenu Rada i Toksikologiju (2017), Vol. 68, No. 2, pp. A10	5.4.1 case b) Relevant but supplementary information: Commentary on IARC evaluation.
593	Suleman M. et al.	CA 7.1.4.1	2019	Laboratory simulation studies of leaching of the priority pesticides and their transformation products in soils	Journal of Animal and Plant Sciences (2019), Vol. 29, No. 4, pp. 1112	5.4.1 case b) Relevant but supplementary information: It does not follow the OECD Column Leaching Guideline (OECD 312). Rather than applying artificial rain continuously for 48 hrs as per guideline, an unspecified amount of artificial rain is applied at the end of the day to achieve 35-40 mL of leachate the following morning.
594	Sun Q. et al.	CA 8.5	2012	Effects of typical herbicides on soil respiration and N2O emissions from soil added with different nitrogen fertilizers.	Huan jing ke xue= Huanjing kexue (2012), Vol. 33, No. 6, pp. 1994	5.4.1 case b) Relevant but supplementary information: The study uses soil from fields in China, without describing the history of the fields (e.g. prior pesticide and fertilizer use), soil sampling, and soil storage conditions prior to the start of the experiment. Soil characteristics are unclear as no information on e.g. CEC and water holding capacity is available. The study was not conducted to a relevant guideline and thus no validity criteria are available. A negative control was included, but no information on replicates is available and only one test item concentration was tested. No positive control was tested. Application of the test item is not described well, the active substance content of the test item is not given and no verification of applied test amount was performed. Finally, there is no quantifiable endpoint presented.
595	Swartjes F. A. et al.	CA 7.5	2020	Measures to reduce pesticides leaching into groundwater-based drinking water resources: An appeal to national and local governments, water boards and farmers	The Science of the total environment (2020), Vol. 699, pp. 134186	5.4.1 case b) Relevant but supplementary information: Does not provide new data but summarizes exceedances of >75% of 0.1 ug/L for GW abstractions used for Drinking Water. Also proposes measures to reduce pesticide concentrations in GW.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
596	Tahir H. M. et al.	CA 8.3	2019	Effect of Pesticides on Biological Control Potential of Neoscona theisi (Araneae: Araneidae)	JOURNAL OF INSECT SCIENCE (2019), Vol. 19, No. 2, pp. 1	5.4.1 case b) Relevant but supplementary information: Considered supplemental as the approach used does not follow an approach recognised at EU level for use in risk assessment.
597	Takeuchi I. et al.	CA 5.9.5	2019	Decrease in Butyrylcholinesterase Accompanied by Intermediate-like Syndrome after Massive Ingestion of a Glyphosate-surfactant.	Internal medicine (2019), Vol. 15; No. 58, pp. 3057	5.4.1 case b) Relevant but supplementary information: Description of a poisoning case related to a surfactant, symptoms are not unusual.
598	Tang T. et al.	CA 7.5	2017	Hysteresis and parent-metabolite analyses unravel characteristic pesticide transport mechanisms in a mixed land use catchment.	Water Research (2017), Vol. 124, pp. 663	5.4.1 case b) Relevant but supplementary information: Use of adapted hysteresis modeling to improve understanding on pesticide metabolite transport behaviours in catchments with diverse pesticide sources and complex transport mechanisms and provide a basis for effective management strategies. Provides information on other sources of AMPA (besides glyphosate degradation).
599	Tongo I. et al.	CA 6.4.2	2015	Human health risks associated with residual pesticide levels in edible tissues of slaughtered cattle in Benin City, Southern Nigeria.	Toxicology Reports (2015), Vol. 2, pp. 1117	5.4.1 case b) Relevant but supplementary information: Provides information on the relative residue levels in various edible cattle tissues but since the exposure of the cattle is not known no transfer factors can be derived.
600	Tarazona J. V. et al.	CA 5.5	2017	Glyphosate toxicity and carcinogenicity: a review of the scientific basis of the European Union assessment and its differences with IARC.	Archives of toxicology (2017), Vol. 91, No. 8, pp. 2723	5.4.1 case b) Relevant but supplementary information: Comparison of EU regulatory review with IARC evaluation.
601	Tarazona J. V. et al.	CA 5.5	2017	Response to the reply by C. J. Portier and P. Clausing, concerning our review "Glyphosate toxicity and carcinogenicity: a review of the scientific basis of the European Union assessment and its differences with IARC".	Archives of toxicology (2017), Vol. 91, No. 9, pp. 3199	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, ref to Portier et al_2017_Arch Toxicol (2017), Vol. 91, No. 9, pp. 3195-3197.
602	Tarone R. E.	CA 5.5	2018	On the International Agency for Research on Cancer classification of glyphosate as a probable human carcinogen	European journal of cancer prevention (2018), Vol. 27, No. 1, pp. 82	5.4.1 case b) Relevant but supplementary information: review, secondary source.
603	Tauchnitz N. et al.	CA 7.5	2017	Quantification of pesticide input into surface waters in a small catchment area (Querne/Weida). Quantifizierung von Pflanzenschutzmittel(PSM)-Eintraegen in Oberflaechengewaesser in einem Kleineinzugsgebiet (Querne/Weida).	Lysimeter Forschung- Moeglichkeiten und Grenzen Lysimeter research - options and limits, 9-10 May 2017, Raumberg-Gumpenstein, Austria (2017), pp. 11	5.4.1 case b) Relevant but supplementary information: Provides information on surface water sampling in Germany, but no concentrations of glyphosate reported.
604	Thakur D. S. et al.	CA 5.9.5	2014	Glyphosate poisoning with acute pulmonary edema.	Toxicology international (2014), Vol. 21, No. 3, pp. 328	5.4.1 case b) Relevant but supplementary information: This is a case report of the clinical manifestations of glyphosate-based herbicide ingestions and discusses predictors of mortality in suicidal ingestions and therefore should not impact registration decisions.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
605	Thompson H. M. et al.	CA 6.10.1	2014	Evaluating exposure and potential effects on honeybee brood (Apis mellifera) development using glyphosate as an example.	Integrated environmental assessment and management (2014), Vol. 10, No. 3, pp. 463	5.4.1 case b) Relevant but supplementary information: No MRLs are currently set for presented commodities and these commodities are not considered for dietary risk assessment either. Therefore, the findings do not directly impact the consumer risk assessment.
606	Tizhe E. V. et al.	CA 5.3	2014	Influence of zinc supplementation on histopathological changes in the stomach, liver, kidney, brain, pancreas and spleen during subchronic exposure of Wistar rats to glyphosate.	Comparative clinical pathology (2014), Vol. 23, No. 5, pp. 1535	5.4.1 case b) Relevant but supplementary information: Formulation tested (Bushfire, Monsanto Europe, 360 g/L glyphosate; 441 g/L potassium salt). Non-representative formulation for EU.
607	Tizhe E. V. et al.	CA 5.3	2013	Haematogical changes induced by subchronic glyphosate exposure: ameliorative effect of zinc in Wistar rats.	Sokoto Journal of Veterinary Sciences (2013), Vol. 11, No. 2, pp. 28	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Bushfire, 441 g/L potassium salt, 360 g/L a.e.). Non-representative formulation for EU.
608	Todorovic G. R. et al.	CA 7.5	2010	Dispersion of glyphosate in soils through erosion. Environmental Quality 4	Air, water, and soil pollution (2010), Vol. 4, pp. 15	5.4.1 case b) Relevant but supplementary information: Analysis of runoff samples from small vegetative field plots following glyphosate application and subsequent artificial rain is not expected to provide additional relevant data. Furthermore, no details of analytical methods is reported.
609	Tome H. V. V. et al.	CA 8.3.1	2020	Frequently encountered pesticides can cause multiple disorders in developing worker honey bees.	Environmental pollution (2020), Vol. 256, pp. 113420	5.4.1 case b) Relevant but supplementary information: The data presented are relevant to the wider discussion of the effects of glyphosate on pollinators, but as the rates established for glyphosate used in the study were based on reported levels found in pollen and wax from another active substance, from an exposure perspective, they cannot be related to glyphosate.
610	Tong M. et al.	CA 6.2.1	2017	Uptake, Translocation, Metabolism, and Distribution of Glyphosate in Nontarget Tea Plant (Camellia sinensis L.).	Journal of agricultural and food chemistry (2017), Vol. 65, No. 35, pp. 7638	5.4.1 case b) Relevant but supplementary information: Supplementary information on the uptake and metabolism of glyphosatephoste applied in nutrient solution totea plants.
611	Tribe D.	CA 5.5	2013	Serious inadequacies regarding the pathology data presented in the paper by Seralini et al. (2012).	Food and Chemical Toxicology (2013), Vol. 53, pp. 452	5.4.1 case b) Relevant but supplementary information: Letter to the Editor, Comment on Seralini et al._2012_Food Chemical Toxicol (2012), retracted.
612	Truta E. et al.	CA 8.6.2	2011	Evaluation of Roundup-induced toxicity on genetic material and on length growth of barley seedlings.	Acta biologica Hungarica (2011), Vol. 62, No. 3, pp. 290	5.4.1 case b) Relevant but supplementary information: Impact of glyphosate product on barley seedling development. Unclear how endpoint could be used in risk assessment.
613	Tush D. et al.	CA 7.1.2.1.1	2018	Dissipation of polyoxyethylene tallow amine (POEA) and glyphosate in an agricultural field and their co-occurrence on streambed sediments.	The Science of the total environment (2018), Vol. 636, pp. 212	5.4.1 case b) Relevant but supplementary information: Study was conducted in the US but provides data on POEA, glyphosate, and AMPA adsorption and dissipation in top 45 cm of soil and in stream bed sediments. Conclusions useful in qualitative rather than quantitative way.
614	Uchida M. et al.	CA 8.2.1	2012	Toxicity evaluation of glyphosate agrochemical components using Japanese medaka (Oryzias latipes) and DNA microarray gene expression analysis	The Journal of toxicological sciences (2012), Vol. 37, No. 2, pp. 245	5.4.1 case b) Relevant but supplementary information: The material and methods part lack some important information. Only glyphosate was sufficiently documented, but the formulation Roundup is not specified. In addition, it is unclear whether the test concentrations for the formulation refer to the active ingredient or to the product. The test design is not adequately described. Only a concentration range

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						was given and tested dose rates remain unclear. The performance of a control group as well as the description of observations is not reported. No mortality data neither for the test concentrations nor for the controls was given to evaluate the results. Furthermore, there was no analytical verification of test concentrations reported. No suitable exposure throughout the test was demonstrated and thus the reliability of the study is questionable. The test guideline followed was not stated nor was the study conducted to GLP.
615	Ulu T. C. et al.	CA 8.4.2	2016	Effects of different pesticides on virulence and mortality of some entomopathogenic nematodes.	ISJ-Invertebrate Survival Journal (2016), Vol. 13, pp. 111	5.4.1 case b) Relevant but supplementary information: Nematode mortality and effects on virulence are not endpoints used in EU level ecotox risk assessment for the renewal.
616	Umsza-Guez M. A. et al.	CA 6.10.1	2019	Herbicide determination in Brazilian propolis using high pressure liquid chromatography.	International journal of environmental health research (2019) pp. 1 (Ahead of print)	5.4.1 case b) Relevant but supplementary information: Currently no EU MRL is set for propolis and since propolis is not taken into account for dietary risk assessment in the EU. Because of that and due to the reliability of the analytical method is not clearly established the publication is considered supplementary.
617	Uren Webster T. M. et al.	CA 8.2.2, CA 8.2.3, CP 10.2.2, CP 10.2.3	2014	Effects of glyphosate and its formulation, roundup, on reproduction in zebrafish (Danio rerio).	Environmental science & technology (2014), Vol. 48, No. 2, pp. 1271	5.4.1 case b) Relevant but supplementary information: The test substance Roundup GC is not the representative formulation for the Annex I renewal. There was only a single glyphosate exposure group at 10 mg/L prepared from analytical grade. The purity of the material was not confirmed, but it was stated to be analytical grade. The study provides no endpoints for glyphosate, that could be used in the ecotoxicology risk assessment for Annex I renewal. Thus the study is conssidered supplementary only.
618	Usenko O. M. et al.	CA 8.2, CP 10.2	2010	Effect of fluorine containing herbicides on functional activity of algae	Gidrobiologicheskii Zhurnal (2010), Vol. 46, No. 1, pp. 75	5.4.1 case b) Relevant but supplementary information: Phytoplankton collected in a field in Ukraine. Unclear what exposure the test species may have had to pesticides or other chemicals previously. Test design is not specified at all. Unclear main points: acclimatisation period, application of test substance, number of replicates or cells per replicates. Unclear if result values refer to product or active igredient. No results in values which can be used for the risk assessment.
619	Varnai V. M. et al.	CA 5.9.5	2013	Report of the poison control centre for the period 1 January - 31 December 2012. Original title: Izvjesce centra za kontrolu otrovanja za razdoblje od 1. Sijecnja do 31. Prosinca 2012.	Arhiv za Higijenu Rada i Toksikologiju (2013), Vol. 64, No. 1, pp. 183	5.4.1 case b) Relevant but supplementary information: This is a report from the Croatian Poison Center documenting types of exposure reported in 2012. Of the 134 calls regarding pesticide exposure, 84 demonstrated "effects" with 9 described as "serious". Glyphosate was listed as one of the pesticides demonstrating a serious effect. There were no other details provided and there were no fatalities as a result of pesticide exposure.
620	Vazquez D. E. et al.	CA 8.3.1	2018	Glyphosate affects the larval development of honey bees depending on the susceptibility of colonies	PLoS One (2018), Vol. 13, No. 10, pp. E0205074	5.4.1 case b) Relevant but supplementary information: Endpoints presented are considered supplemental as the method of exposure used for the bees were not described.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
621	Veale D. J. H. et al.	CA 5.9.5	2013	Toxicovigilance I: a survey of acute poisonings in South Africa based on tygerberg poison information centre data	SAMJ (2013), Vol. 103, No. 5, pp. 293	5.4.1 case b) Relevant but supplementary information: This article summarises the chemicals used in South Africa for suicide. Glyphosate is only mentioned in a table in the article as being involved in 23 cases over a 1 year period accounting for 0.9% of the overall cases reported.
622	Velasques R. R. et al.	CA 8.2.1	2016	Roundup(®) in Zebrafish: Effects on Oxidative Status and Gene Expression.	Zebrafish (2016), Vol. 13, No. 5, pp. 432	5.4.1 case b) Relevant but supplementary information: The data presented demonstrates that in the presence of a toxicant, there are changes in the oxidative status of zebrafish gills and liver tissue. However, these data cannot be related to an Annex I risk assessment for renewal.
623	Velastegui-Espin G. P. et al.	CA 5.6.1	2018	Glyphosate: its use and implications for human health. El glifosato: su uso e implicaciones en la salud humana.	Journal of the Selva Andina Biosphere (2018), Vol. 6, No. 2, pp. 86	5.4.1 case b) Relevant but supplementary information: review, secondary source of information.
624	Vera-Candioti J. et al.	CA 5.4	2013	Single-cell gel electrophoresis assay in the ten spotted live-bearer fish, Cnesterodon decemmaculatus (Jenyns, 1842), as bioassay for agrochemical-induced genotoxicity.	Ecotoxicology and environmental safety (2013), Vol. 98, pp. 368	5.4.1 case b) Relevant but supplementary information: GBHs tested on fish
625	Vidyadhara et al.	CA 5.9.5	2014	Atypical presentation of glyphosate poisoning.	Indian Journal of Critical Care Medicine (2014), Vol. 18, Suppl. 1, pp. S36.	5.4.1 case b) Relevant but supplementary information: This is a report about multiorgan failure after suicidal ingestion of formulated glyphosate and should not impact re-registration.
626	Vincent K. et al.	CA 8.1.4	2015	The toxicity of glyphosate alone and glyphosate-surfactant mixtures to western toad (Anaxyrus boreas) tadpoles.	Environmental toxicology and chemistry (2015), Vol. 34, No. 12, pp. 2791	5.4.1 case b) Relevant but supplementary information: Approaches used are not recognised approaches, but do inform on the toxicity of glyphosate IPA salt to amphibians in the glyphosate only investigations.
627	Waiman C. V. et al.	CA 7.1.3.1.1	2016	The simultaneous presence of glyphosate and phosphate at the goethite surface as seen by XPS, ATR-FTIR and competitive adsorption isotherms	Colloids and Surfaces A: Physicochemical and Engineering Aspects (2016), Vol. 498, pp. 121	5.4.1 case b) Relevant but supplementary information: The study does not investigate soil adsorption but mineral. The study does not include an endpoint relevant for the risk assessment.
628	Wang D. et al.	CA 5.9.5	2019	Successful extracorporeal membrane oxygenation support for severe acute diquat and glyphosate poisoning: A case report.	Medicine (2019), Vol. 98, No. 6., pp. e14414	5.4.1 case b) Relevant but supplementary information: This article describes using ECMO to manage a patient with multiorgan failure after formulated glyphosate and diquat ingestion. Since this is describing medical management of suicidal overdoses, it should not impact reregistration
629	Wang G. et al.	CA 5.9.4	2011	Parkinsonism after chronic occupational exposure to glyphosate.	Parkinsonism & related disorders (2011), Vol. 17, No. 6, pp. 486	5.4.1 case b) Relevant but supplementary information: Reversible Parkinsonism in case of acute intoxication is a well-known effect and not specific for glyphosate. No clear causal connection of chronic Parkinsonism to glyphosate from the presented results.
630	Wang M. et al.	CA 7.1.3.1.1	2019	Montmorillonites Can Tightly Bind Glyphosate and Paraquat Reducing Toxin Exposures and Toxicity	ACS omega (2019), Vol. 4, No. 18, pp. 17702	5.4.1 case b) Relevant but supplementary information: Article provides binding properties of glyphosate to calcium and sodium montmorillonite clay. Supplementary information as clay is a soil component, not a soil.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
631	Weir S. M. et al.	CA 8.1.4	2016	Acute toxicity and risk to lizards of rodenticides and herbicides commonly used in New Zealand.	New Zealand Journal of Ecology (2016), Vol. 40, No. 3, pp. 342	5.4.1 case b) Relevant but supplementary information: Species relevance is difficult to relate to an EU level ecotox risk assessment for Annex I.
632	Williams A. L. et al.	CA 5.6	2012	Developmental and reproductive outcomes in humans and animals after glyphosate exposure: a critical analysis.	Journal of toxicology and environmental health. Part B, Critical reviews (2012), Vol. 15, No. 1, pp. 39	5.4.1 case b) Relevant but supplementary information: review, secondary source.
633	Williams B. K. et al.	CA 8.1.4	2010	Larval responses of three midwestern anurans to chronic, low-dose exposures of four herbicides.	Archives of environmental contamination and toxicology (2010), Vol. 58, No. 3, pp. 819	5.4.1 case b) Relevant but supplementary information: Eggs collected from wetlands.
634	Williams G. M.	CA 5.5	2018	Corrigendum to: Glyphosate rodent carcinogenicity bioassay expert panel review (Critical Reviews in Toxicology, (2016), 46, sup1, (44-55), 10.1080/10408444.2016.1214679)	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 914	5.4.1 case b) Relevant but supplementary information: Corrigendum to article Williams_2016, Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 4
635	Williams G. M. et al.	CA 5.5	2016	Glyphosate rodent carcinogenicity bioassay expert panel review.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 44	5.4.1 case b) Relevant but supplementary information: review, secondary source.
636	Williams G. M. et al.	CA 5.5	2018	Corrigendum: A review of the carcinogenic potential of glyphosate by four independent expert panels and comparison to the IARC assessment.	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp. 907	5.4.1 case b) Relevant but supplementary information: Corrigendum to: A review of the carcinogenic potential of glyphosate by four independent expert panels and comparison to the IARC assessment (Critical Reviews in Toxicology, (2016), 46, sup1, pp. 3-20.)
637	Williams G. M. et al.	CA 5.9.4	2016	A review of the carcinogenic potential of glyphosate by four independent expert panels and comparison to the IARC assessment.	Critical reviews in toxicology (2016), Vol. 46, No. sup1, pp. 3	5.4.1 case b) Relevant but supplementary information: review, secondary source.
638	Wood L. J.	CA 6.2.1	2019	The presence of glyphosate in forest plants with different life strategies one year after application.	Canadian Journal of Forest Research (2019), Vol. 49, No. 6, pp. 586	5.4.1 case b) Relevant but supplementary information: In order to properly interpret the findings of the publication, it would be important to determine the residues in the non-target crops shortly after application. However, this information is only available indirectly from other studies. According to the publication : "Compared with levels detected in forest plants immediately after application by Feng and Thompson (1990), levels detected in this study are very low." This means that the residues shortly after application were extremely high, far above the levels that may occur in non-target plants in Europe due to contamination by spray-drift. For this reason and after full text review, the publication is considered to be of limited relevance to the EU renewal dossier. It only provides supplementary information.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
639	Wrobel M. H.	CA 5.8.2	2018	Glyphosate affects the secretion of regulators of uterine contractions in cows while it does not directly impair the motoric function of myometrium in vitro.	Toxicology and applied pharmacology (2018), Vol. 349, pp. 55	5.4.1 case b) Relevant but supplementary information: Glyphosate used is not sufficiently characterized and the analysis of glyphosate, hormones and prostaglandins is not sufficiently documented. This publication is considered unreliable.
640	Wu C. J. et al.	CA 5.9.5	2015	PiCCO interpretation for acute glyphosate intoxication with shock: Favors cardiogenic origin.	Clinical Toxicology (2015), Vol. 53, No. 4, pp. 329	5.4.1 case b) Relevant but supplementary information: This is a report regarding multiorgan failure following suicidal ingestion of formulated glyphosate and should not impact re-registration.
641	Wu I-L. et al.	CA 5.9.5	2015	Glyphosate intoxication resulting in ventricular dysrhythmias and cardiogenic shock.	Clinical Toxicology (2015), Vol. 53, No. 4, pp. 329	5.4.1 case b) Relevant but supplementary information: This is a report regarding multiorgan failure and use of ECMO following suicidal ingestion of formulated glyphosate and should not impact re-registration.
642	Wu M-H. et al.	CA 5.9.5	2015	Successful treatment with hemodialysis for acute renal failure after glyphosate poisoning: A case report.	Clinical Toxicology (2015), Vol. 53, No. 4, pp. 330	5.4.1 case b) Relevant but supplementary information: This is a report about renal failure and haemodialysis after suicidal ingestion of formulated glyphosate and should not impact re-registration.
643	Wunnapuk K. et al.	CA 5.9.5	2014	Use of a glyphosate-based herbicide-induced nephrotoxicity model to investigate a panel of kidney injury biomarkers.	Toxicology letters (2014), Vol. 225, No. 1, pp. 192	5.4.1 case b) Relevant but supplementary information: Formulation tested in vivo (Concentrate Roundup Weedkiller, 360 g/L isopropylamine salt, Australia) at high acute doses of 250 - 2500 mg/kg.
644	Xia S. et al.	CA 8.2.3	2013	Induction of vitellogenin gene expression in medaka exposed to glyphosate and potential molecular mechanism	Zhongguo Huanjing Kexue (2013), Vol. 33, No. 9, pp. 1656	5.4.1 case b) Relevant but supplementary information: The study was not conducted according to GLP and a relevant guideline was not followed. The current EU stepwise endocrine approach is detailed, and the approach conducted within this study does conform to the suggested guidance. Significant limitations in the study include a lack of a standard testing approach or specific validation criteria. The test concentrations were not analytically verified and the critical dose regime provided to the Medaka is lacking. Similarly the source of the fish tested is unknown. No clear dose response relationship or derived endpoint from the study could be determined.
645	Xie RuiTao et al.	CA 8.2.1, CP 10.2.1	2010	The acute toxicity of five pesticides to yellow catfish Pelteobagrus vachelli.	Fisheries Science (2010), Vol. 29, No. 5, pp. 274	5.4.1 case b) Relevant but supplementary information: Acute effects on Yellow Catfish in a static 96 h test. The application method (preparation of test solution etc.) is not specified. The concentrations used is unclear, and appears to be tested in a range between 7 to 20 mg/L No information on the test item whether it was product or active ingredient was provided. Therefore, the biological results can not be used for the risk assessment.
646	Xu Y. et al.	CA 8.2.8, CP 10.2.3	2010	Acute Toxicity of Ten Pesticides to Larval Red Swamp Crayfish Procambarus Clarkii.	Asian Journal of Ecotoxicology (2010), Vol. 5, No. 1, pp. 50.	5.4.1 case b) Relevant but supplementary information: Effects on red swamp crayfish. Test species raised in and collected from a rice field in Shanghai. It is not clear what exposure the test species may have had to pesticides or other chemicals previously. It is not clear if the glyphopsate is technical or product. No biological results (e.g. mortalities) for the control or any test concentration reported. The study is considered unreliable.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
647	Xu Y-g. et al.	CA 8.2.4	2015	Joint Toxicity of Glyphosate and As(III)to Daphnia magna in Aquatic Environment	Journal of Agro-Environment Science (2015), Vol. 34, No. 11, pp. 2076	5.4.1 case b) Relevant but supplementary information: This study concentrates on models used to estimate the individual and mixture toxicity of glyphosate and As (III) to Daphnia magna. LC50 values were compared with measured data. The study was not conducted according to GLP, however the acute toxicity studies were conducted to a relevant ISO guideline. Preparation and dose verification were not performed therefore the endpoint is questionable. The study is considered unreliable.
648	Yan W. et al.	CA 7.1.3.1.1	2018	Molecular Insights into Glyphosate Adsorption to Goethite Gained from ATR-FTIR, Two-Dimensional Correlation Spectroscopy, and DFT Study.	Environmental science & technology (2018), Vol. 52, No. 4, pp. 1946	5.4.1 case b) Relevant but supplementary information: Study of molecular-level interfacial configurations and reaction mechanisms of glyphosate with iron (hydr)oxides. The influence of phosphate is also described.
649	Yang Y. et al.	CA 7.1.3.1.1, CA 7.2.1.3	2018	Comparative study of glyphosate removal on goethite and magnetite: Adsorption and photo-degradation.	Chemical Engineering Journal (2018), Vol. 352, pp. 581	5.4.1 case b) Relevant but supplementary information: Study of photodegradation of glyphosate in environment by goethite and magnetite.
650	You M-J. et al.	CA 5.9.5	2015	Clostridium tertium bacteremia in a patient with glyphosate ingestion.	The American journal of case reports (2015), Vol. 16, pp. 4	5.4.1 case b) Relevant but supplementary information: This article discussed the use of haemodialysis in the management of hyperkalemia and metabolic acidosis after formulated glyphosate overdose. Haemodialysis is often used to manage refractory hyperkalemia and acidosis. This article discusses medical management of suicidal ingestions and therefore should not impact registration decisions.
651	You W-y. et al.	CA 8.3.2, CP 10.3.2	2010	Toxicity Evaluation of Sixteen Herbicides to Bombyx mori.	Asian Journal of Ecotoxicology (2010), Vol. 5, No. 1, pp. 91	5.4.1 case b) Relevant but supplementary information: Effects on silkworm via exposure of treated leaves. However, the application method is not specified. The amount of test solution per leaf, the consumed diet per silkworm and the number of organisms per replicate is unclear. Also no control results are available. Therefore the biological results can not be used for risk assessment.
652	You Y. et al.	CA 5.9.5	2012	Effect of intravenous fat emulsion therapy on glyphosate-surfactant-induced cardiovascular collapse.	The American journal of emergency medicine (2012), Vol. 30, No. 9, pp. 2097.e1	5.4.1 case b) Relevant but supplementary information: This article is discussing the efficacy of intravenous fat emulsion as therapy for formulated glyphosate overdose. This report contributes to the evidence that intravenous fat emulsion may be a useful treatment for glyphosate overdose as it may limit the toxicity associated with large surfactant ingestions. There are no RCTs for this as it is a suicidal overdose situation.
653	Yu G. C. et al.	CA 5.9.5	2017	The clinical analytics of 10 patients with acute glyphosate poisoning	Chinese journal of industrial hygiene and occupational diseases (2017), Vol. 35, No. 5, pp. 382	5.4.1 case b) Relevant but supplementary information: This is a case study describing the clinical course of 10 patients who drank formulated glyphosate. There were no long-term sequelae of ingestion, and all 10 patients survived. These were suicdal ingestions and should not impact re-registration.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
654	Yusof S. et al.	CA 8.2.1	2014	Effect of glyphosate-based herbicide on early life stages of Java medaka (Oryzias javanicus): a potential tropical test fish.	Marine pollution bulletin (2014), Vol. 85, No. 2, pp. 49	5.4.1 case b) Relevant but supplementary information: There is insufficient explanation provided on the analytical verification of the test concentrations. The test concentrations were high ranging from 100 to 500 ppm. A regulatory endpoint is not available. There is no verification of dose levels, and the study does not conform to any guidelines nor GLP. The article can be considered as supplementary information only.
655	Zhang C. et al.	CA 5.9.4	2016	Health effect of agricultural pesticide use in China: implications for the development of GM crops	Scientific reports (2016 Vol. 6, pp. 34918	5.4.1 case b) Relevant but supplementary information: Results are likely to be valid for glyphosate under the exposure circumstances of the study, however the study was not appropriately designed for assessment of chronic health effects. In particular, there were short follow-ups and limited exposure histories.
656	Zhang C. et al.	CA 5.9.4	2018	A comparison of the effects of agricultural pesticide uses on peripheral nerve conduction in China	Scientific Reports (2018), Vol. 8, No. 1, pp. 1	5.4.1 case b) Relevant but supplementary information: Results agree with biological properties of the various pesticides. However, an inappropriate design to study the potentially chronic association between nerve conduction and pesticide exposure. There was short follow-up and limited exposure histories.
657	Zhang F. et al.	CA 5.9.1	2019	Study on the effect of occupational exposure to glyphosate on blood routine.	Chinese journal of industrial hygiene and occupational diseases (2019), Vol. 37, No. 2, pp. 126	5.4.1 case b) Relevant but supplementary information: No adverse outcome identified.
658	Zhang F. et al.	CA 5.9.2	2018	Relationships between internal and external exposure indicators of glyphosate in occupational workers.	Journal of Environmental & Occupational Medicine (2018), Vol. 35, No. 11, pp. 990	5.4.1 case b) Relevant but supplementary information: Manufacturing practices in China are not representative of EU manufacturing protocols
659	Zhang F. et al.	CA 5.9.4	2017	Study of the effect of occupational exposure to glyphosate on hepatorenal function.	Chinese journal of preventive medicine (2017), Vol. 51, No. 7, pp. 615	5.4.1 case b) Relevant but supplementary information: Poorly described study design, methods, and analysis. This publication is considered unreliable.
660	Zhang K. et al.	CA 7.1.4	2019	Can we use a simple modelling tool to validate stormwater biofilters for herbicides treatment?	Urban Water Journal (2019), Vol. 16, pp. 412	5.4.1 case b) Relevant but supplementary information: Biofilter validation model. Field validation work performed in Australia. Model may be of interest even though field data not directly relevant to the EU.
661	Zhang L. et al.	CA 5.9.4	2019	Exposure to glyphosate-based herbicides and risk for non-Hodgkin lymphoma: A meta-analysis and supporting evidence	Mutation Research, Reviews in Mutation Research (2019), Vol. 781, pp. 186	5.4.1 case b) Relevant but supplementary information: Meta-analyses cannot overcome the limitations of the studies included. This publication is considered unreliable.
662	Zhang Q. et al.	CA 8.3.2, CP 10.3.2	2011	An evaluation on acute toxicity of 29 pesticides to Bombyx mori	Canye Kexue (2011), Vol. 37, No. 2, pp. 343	5.4.1 case b) Relevant but supplementary information: Effects of glyphosate (95% TC) on silkworms by using the leaf dipping method: 5 g mulberry leaves were evenly immersed in 10 mL test solution for 10s. However, no useful concentration can be derived. No control results available.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
663	Zhang S. et al.	CA 8.2.1	2017	Biological impacts of glyphosate on morphology, embryo biomechanics and larval behavior in zebrafish (Danio rerio).	Chemosphere (2017), Vol. 181, pp. 270	5.4.1 case b) Relevant but supplementary information: Provides information on a test species that is relied upon in the risk assessment. But endpoints cannot be related to an EU level ecotox risk assessment.
664	Zhang W. et al.	CA 7.1.4.1.1, CA 7.1.4.1.2, CA 7.2.1.1	2019	A method for determining glyphosate and its metabolite aminomethyl phosphonic acid by gas chromatography-flame photometric detection.	Journal of chromatography. A (2019), Vol. 1589, pp. 116	5.4.1 case b) Relevant but supplementary information: Primarily an analytical methods paper with examples of hydrolysis and column leaching data provided. Insufficient methodology information provided for risk assessment.
665	Zhao H. et al.	CA 5.8.3	2018	Effects of Glyphosate on Testosterone Synthesis in Male Rats.	Asian Journal of Ecotoxicology (2018), Vol. 13, No. 5, pp. 242	5.4.1 case b) Relevant but supplementary information: Reporting of the experimental conditions is not complete.
666	Zhao W. et al.	CA 5.8.2	2011	Effect of glyphosate on oxidative damage of mice	Dulixue Zazhi (2011), Vol. 25, No. 5, pp. 364	5.4.1 case b) Relevant but supplementary information: No new information relevant for the risk assessment.
667	Zhao Y. et al.	CA 7.1.3.1.1	2015	Use of Fe/Al drinking water treatment residuals as amendments for enhancing the retention capacity of glyphosate in agricultural soils.	Journal of environmental sciences (2015), Vol. 34, pp. 133	5.4.1 case b) Relevant but supplementary information: Use of Fe/Al drinking water treatment residuals (WTRs) as a soil amendment to increase glyphosate sorption and decrease desorption in soils. Supplementary information not directly related to efate guideline studies.
668	Zheng Q. et al.	CA 5.9.2	2018	Reversible Parkinsonism induced by acute exposure glyphosate.	Parkinsonism & related disorders (2018), Vol. 50, pp. 121	5.4.1 case b) Relevant but supplementary information: Reversible Parkinsonism in case of acute in-toxication is a well-known effect and not specific for glyphosate.
669	Zheng Q. et al.	CA 5.9.2	2018	Reply for the comment on "Reversible Parkinsonism induced by acute exposure glyphosate".	Parkinsonism and Related Disorders (2018), Vol. 56, pp. 108	5.4.1 case b) Relevant but supplementary information: Letter to the editor, comments on Goldstein_2018, Parkinsonism Relat Disord. (2018), Vol. 56, pp. 107
670	Zouaoui K. et al.	CA 5.9.5	2013	Determination of glyphosate and AMPA in blood and urine from humans: about 13 cases of acute intoxication.	Forensic science international (2013), Vol. 226, No. 1-3, pp. E20	5.4.1 case b) Relevant but supplementary information: This report demonstrates a link between higher blood and urine concentrations with formulated glyphosate overdoses and a poorer outcome. This is unsurprising as it reflects that patients drank a larger volume. Larger volumes of formulated product are associated with more toxicity due to the caustic nature of the surfactant, not the amount of active ingredient. All of the laboratory parameters are expected in critically ill patients. As these were suicidal ingestions, this paper should not impact re-registration.
671	Zyoud S. H. et al.	CA 5.9.5	2017	Global research production in glyphosate intoxication from 1978 to 2015: A bibliometric analysis.	Human & experimental toxicology (2017), Vol. 36, No. 10, pp. 997	5.4.1 case b) Relevant but supplementary information: This article analyzes the reports of increase in glyphosate intoxications from the early 1970s-2016. Given the increase in use over the same time period it is not surprising that there has been a increase in reporting. This should not impact re-registration.

Table 36: Articles of unclear relevance (category C) after detailed assessment: sorted by data requirement(s)

No	Data requirement (indicated by the corresponding CA / CP data point No.)	Author(s)	Year	Title	Source	Justification
673	CA 5.3	Aitbali Y. et al.	2018	Glyphosate based- herbicide exposure affects gut microbiota, anxiety and depression-like behaviors in mice.	Neurotoxicology and teratology (2018), Vol. 67, pp. 44	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study uses Roundup administered at half of or at the NOAEL concentration via a stomach tube. The surfactant is irritating and any negative results are not surprising. The acidic effect of glyphosate is also a concern.
675	CA 5.8	Bote K. et al.	2019	Minimum Inhibitory Concentration of Glyphosate and of a Glyphosate-Containing Herbicide Formulation for Escherichia coli Isolates - Differences Between Pathogenicand Non-pathogenic Isolates and Between Host Species.	Frontiers in microbiology (2019), Vol. 10, pp. 932	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. The study uses a system designed to measure antibiotic MICs that are usually done by culturing bacteria in a specific media for antibiotiic diffusion in ug/ml range. Instead the paperlooks at glyphosate in mg/ml range following MIC procedures. There is no justification for the dose, which should be at about 100000X lower dose. Most gut microbes microbes are anaerobes.
680	CA 5.8	Kruger M. et al.	2013	Glyphosate suppresses the antagonistic effect of Enterococcus spp. on Clostridium botulinum.	Anaerobe (2013), Vol. 20, pp. 74	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Moreover, the doses used in this study are not justified and are unrealistically high. Cultures are batch culture and it is unclear if conditions are to get values in growing phase. Comparisons between glyphosate and Roundup are completely different so they cannot be compared.
679	CA 5.8.2	Good P.	2018	Evidence the U.S. autism epidemic initiated by acetaminophen (Tylenol) is aggravated by oral antibiotic amoxicillin/clavulanate (Augmentin) and now exponentially by herbicide glyphosate (Roundup).	Clinical nutrition ESPEN (2018), Vol. 23, pp. 171	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This paper contains no new data. It uses computer algorithms to make associations that are not proved. It claims that glyphosate impacts methionine and tryptophan and ignores that these amino acids are not only essential for the human diet but that microbially derived amino acids are only available via coprophagy.

No	Data requirement (indicated by the corresponding CA / CP data point No.)	Author(s)	Year	Title	Source	Justification
681	CA 5.8.2	Lozano V. L. et al.	2018	Sex-dependent impact of Roundup on the rat gut microbiome.	Toxicology reports (2018), Vol. 5, pp. 96	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study has a number of issues related to design: Rats are at the end of their life when feces were sampled. It is not clear of feces were sampled pre- or post mortem. Results are confounded by advanced age or even tumor status of these rats, predominantly mammary. The smaller than expected number of phyla may be related to age of the rats. Short-term responses are not surprising: cells in direct contact with a substance in a test tube (liquid medium) will respond differently than cells exposed to that same substance within their natural environment. So in vitro data usually show cells have a greater sensitivity to the substance than in vivo data. And within the intestinal environment there is much to dilute, diminish or mask the substance's effect. This diminished effect in vivo has been documented repeatedly for a large number of test substances.
682	CA 5.8.2	Mao Q. et al.	2018	The Ramazzini Institute 13-week pilot study on glyphosate and Roundup administered at human-equivalent dose to Sprague Dawley rats: effects on the microbiome.	Environmental Health (2018), Vol. 29, No. 17, pp 50	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In this publication there was no clinical evidence of alterations in activity or behavior in pups. Body weight, water and feed consumption both in dams and pups were no different across the groups. Litter sizes were fully comparable among groups. To identify changes in microbes with multiple analyses in groups of animals is not unexpected and not necessarily indicative of a specific effect of the active substance. Changes within all rats due to maturation are greater than the differences between treatment groups. Moreover there are several points limiting the significance of the results: 1) information to calculate dose is not in the paper and seems intentional, 2) ADI is not the same as exposure which averages 1% of the ADI, and clinical signs were by definition not observed at the NOAEL which is 100-fold greater than the ADI. Animals in these toxicity studies had gut microbes, 3) Claims of exposure via milk are unfounded. The statistical analysis results in some differences but they do not put these changes into the context of whether they are normal.

No	Data requirement (indicated by the corresponding CA / CP data point No.)	Author(s)	Year	Title	Source	Justification
672	CA 6.4	Ackermann W. et al.	2015	The influence of glyphosate on the microbiota and production of botulinum neurotoxin during ruminal fermentation.	Current microbiology (2015), Vol. 70, No. 3, pp. 374.	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. The system used in this study was not developed for microbiological research. Instead it was developed for comparing rates of digestion of feed. It is not a dynamic system like a rumen but a batch culture system. In 48 hrs they showed that adding glyphosate resulted in greater drops in pH as a result of inadequate buffering. The endpoints are consistent with decreased pH. They are inconsistent with more sophisticated rumen simulation techniques that found no effects from glyphosate.
676	CA 6.4	Bote K. et al.	2019	Effect of a Glyphosate-Containing Herbicide on Escherichia coli and Salmonella Ser. Typhimurium in an In Vitro Rumen Simulation System.	European journal of microbiology & immunology, (2019), Vol. 9, No. 3, pp. 94	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study used a rumen simmulation technique that resonably replicated rumen conditions that allowed for dynamic effects of feeding and removal of waste products. In the absence of a suitable dossier datapoint it was allocated to point CA 6.4 as it concerns livestock. However, it is important to note that it is not a residue study and does not provide any data on the transfer of residues from feed to food of animal origin.
678	CA 6.4	Gerlach H. et al.	2014	Oral application of charcoal and humic acids to dairy cows influences Clostridium botulinum blood serum antibody level and glyphosate excretion in urine.	Journal of Clinical Toxicology (2014), Vol. 4, No. 2, pp. 186	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Additionally there significant difficiencies (lack of control group, treatments). Glyphosate concentrations in urine would be highly impacted by urine volume which is affected by milk production and environmental temperature. Interestingly, aerobes from feces are tested and ruminants rely on strict anaerobes in the rumen and colon.
684	CA 6.4	Nielsen L. N. c. r. et al.	2017	Glyphosate has limited short-term effects on commensal bacterial community composition in the gut environment due to sufficient aromatic amino acid levels	Environmental pollution (2018), Vol. 233, pp. 364	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study shows that aromatic amino acids in culture conditions can negate impact on gut microbes from glyphosate because microbes with sensitive EPSPS can get these amino acids from the media.
685	CA 6.4	Riede S. et al.	2016	Investigations on the possible impact of a glyphosate-containing herbicide on ruminal metabolism and bacteria in vitro by means of the 'Rumen Simulation Technique'.	Journal of applied microbiology (2016), Vol. 121, No. 3, pp. 644	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In this study a system was developed for studying ruminal organisms that is dynamic, used mixed population of microbes, and is periodically fed with removal of waste products. There were no impacts of glyphosate formulation to this system.

No	Data requirement (indicated by the corresponding CA / CP data point No.)	Author(s)	Year	Title	Source	Justification
686	CA 6.4	Schrodl W. et al.	2014	Possible effects of glyphosate on Mucorales abundance in the rumen of dairy cows in Germany.	Current microbiology (2014), Vol. 69, No. 6, pp. 817	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Methodological shortcomings of the approaches used reduce the significance of the results (rumen fungi are stricly anaerobic, but they use aerobic cultures; 2) spot-urine concentrations are highly affected by the level of milk production 3) the ELISA is not validated and the LOD ws not used, no validation is described for other assays.
687	CA 6.4	Shehata A. A. et al.	2014	Neutralization of the antimicrobial effect of glyphosate by humic acid in vitro.	Chemosphere (2014), Vol. 104, pp. 258	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In the absence of a suitable dossier datapoint it was allocated to point CA 6.4 as it concerns livestock. However, it is important to note that it is not a residue study and does not provide any data on the transfer of residues from feed to food of animal origin.
688	CA 6.4	Shehata A. A. et al.	2013	The effect of glyphosate on potential pathogens and beneficial members of poultry microbiota in vitro.	Current microbiology (2013), Vol. 66, No. 4, pp. 350	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. The publication does not provide new information (potential effects on microorganims with sensitive EPSPS are well known) and real world conditions of the gut are not replicated (study conducted on minimal media; microorganisms exposed to extremely high doses of glyphosate (1000x); aged cultures inducing additional stress).
689	CA 6.4	Vicini J. L. et al.	2019	Glyphosate in livestock: feed residues and animal health.	Journal of animal science (2019), Vol. 97, No. 11, pp. 4509	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Review article.
677	CA 6.5	Clair E. et al.	2012	Effects of Roundup(®) and glyphosate on three food microorganisms: Geotrichum candidum, Lactococcus lactis subsp. cremoris and Lactobacillus delbrueckii subsp. bulgaricus.	Current microbiology (May), Vol. 64, No. 5, pp. 486	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. However, based on the results presented, it is not possible to reach a scientifically sound conclusion that the ability to make cheese using these organisms has been compromised by Roundup formulations. Application of dilutions (1%) of glyphosate were shown to inhibit a yeast-like organism, which is unsurprising. Surfactant solutions are routinely used to sanitize food processing equipment at concentrations at or above those tested by Clair et al. These concentrations are vastly higher than the concentrations of glyphosate or possible surfactant present (if any) in incoming milk.

No	Data requirement (indicated by the corresponding CA / CP data point No.)	Author(s)	Year	Title	Source	Justification
690	CA 8.2.8	Yang X. et al.	2019	Effects of the glyphosate-based herbicide roundup on the survival, immune response, digestive activities and gut microbiota of the Chinese mitten crab, Eriocheir sinensis	Aquatic toxicology (2019), Vol. 214, pp. 105243	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study uses a high dose of roundup formulation. The surfactants in Roundup are known to be toxic to aquatic animals. This publication indicates a potentially significant decline in survivial due to Roundup. Therefore, results obtained for other endpoints beyond survival may be secondary to known toxicity of the surfactants.
674	CA 8.3.1.2	Blot N. et al.	2019	Glyphosate, but not its metabolite AMPA, alters the honeybee gut microbiota	PloS one (2019), Vol. 14, No. 4, pp. e0215466	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In this publication, experiments were conducted with a dose (10x increased) and an exposure for a longer period than is expected to occur from field exposure. Results indicated no effect on survival but some effect on profile of gut microbes. AMPA did not affect profile which could be due to AMPA does not inhibit EPSPS.
683	CA 8.3.1.2	Motta E. V. S. et al.	2018	Glyphosate perturbs the gut microbiota of honey bees.	Proceedings of the National Academy of Sciences of the United States of America (2018), Vol. 115, No. 41, pp. 10305	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This papers describes exposure of bees to glyphosate and its impact on gut microbiota.

Table 37: Articles of unclear relevance (category C) after detailed assessment: sorted by author(s)

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point No.)	Year	Title	Source	Justification
672	Ackermann W. et al.	CA 6.4	2015	The influence of glyphosate on the microbiota and production of botulinum neurotoxin during ruminal fermentation.	Current microbiology (2015), Vol. 70, No. 3, pp. 374.	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. The system used in this study was not developed for microbiological research. Instead it was developed for comparing rates of digestion of feed. It is not a dynamic system like a rumen but a batch culture system. In 48 hrs they showed that adding glyphosate resulted in greater drops in pH as a result of inadequate buffering. The endpoints are consistent with decreased pH. They are inconsistent with more sophisticated rumen simulation techniques that found no effects from glyphosate.
673	Aitbali Y. et al.	CA 5.3	2018	Glyphosate based- herbicide exposure affects gut microbiota, anxiety and depression-like behaviors in mice.	Neurotoxicology and teratology (2018), Vol. 67, pp. 44	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study uses Roundup administered at half of or at the NOAEL concentration via a stomach tube. The surfactant is irritating and any negative results are not surprising. The acidic effect of glyphosate is also a concern.
674	Blot N. et al.	CA 8.3.1.2	2019	Glyphosate, but not its metabolite AMPA, alters the honeybee gut microbiota	PloS one (2019), Vol. 14, No. 4, pp. e0215466	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In this publication, experiments were conducted with a dose (10x increased) and an exposure for a longer period than is expected to occur from field exposure. Results indicated no effect on survival but some effect on profile of gut microbes. AMPA did not affect profile which could be due to AMPA does not inhibit EPSPS.
675	Bote K. et al.	CA 5.8	2019	Minimum Inhibitory Concentration of Glyphosate and of a Glyphosate-Containing Herbicide Formulation for Escherichia coli Isolates - Differences Between Pathogenicand Non-pathogenic Isolates and Between Host Species.	Frontiers in microbiology (2019), Vol. 10, pp. 932	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. The study uses a system designed to measure antibiotic MICs that are usually done by culturing bacteria in a specific media for antibiotiic diffusion in ug/ml range. Instead the paperlooks at glyphosate in mg/ml range following MIC procedures. There is no justification for the dose, which should be at about 100000X lower dose. Most gut microbes microbes are anaerobes.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point No.)	Year	Title	Source	Justification
676	Bote K. et al.	CA 6.4	2019	Effect of a Glyphosate-Containing Herbicide on Escherichia coli and Salmonella Ser. Typhimurium in an In Vitro Rumen Simulation System.	European journal of microbiology & immunology, (2019), Vol. 9, No. 3, pp. 94	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study used a rumen simmulation technique that resonably replicated rumen conditions that allowed for dynamic effects of feeding and removal of waste products. In the absence of a suitable dossier datapoint it was allocated to point CA 6.4 as it concerns livestock. However, it is important to note that it is not a residue study and does not provide any data on the transfer of residues from feed to food of animal origin.
677	Clair E. et al.	CA 6.5	2012	Effects of Roundup(®) and glyphosate on three food microorganisms: Geotrichum candidum, Lactococcus lactis subsp. cremoris and Lactobacillus delbrueckii subsp. bulgaricus.	Current microbiology (May), Vol. 64, No. 5, pp. 486	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. However, based on the results presented, it is not possible to reach a scientifically sound conclusion that the ability to make cheese using these organisms has been compromised by Roundup formulations. Application of dilutions (1%) of glyphosate were shown to inhibit a yeast-like organism, which is unsurprising. Surfactant solutions are routinely used to sanitize food processing equipment at concentrations at or above those tested by Clair et al. These concentrations are vastly higher than the concentrations of glyphosate or possible surfactant present (if any) in incoming milk.
678	Gerlach H. et al.	CA 6.4	2014	Oral application of charcoal and humic acids to dairy cows influences Clostridium botulinum blood serum antibody level and glyphosate excretion in urine.	Journal of Clinical Toxicology (2014), Vol. 4, No. 2, pp. 186	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Additionally there significant difficiencies (lack of control group, treatments). Glyphosate concentrations in urine would be highly impacted by urine volume which is affected by milk production and environmental temperature. Interestingly, aerobes from feces are tested and ruminants rely on strict anaerobes in the rumen and colon.
679	Good P.	CA 5.8.2	2018	Evidence the U.S. autism epidemic initiated by acetaminophen (Tylenol) is aggravated by oral antibiotic amoxicillin/clavulanate (Augmentin) and now exponentially by herbicide glyphosate (Roundup).	Clinical nutrition ESPEN (2018), Vol. 23, pp. 171	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This paper contains no new data. It uses computer algorithms to make associations that are not proved. It claims that glyphosate impacts methionine and tryptophan and ignores that these amino acids are not only essential for the human diet but that microbially derived amino acids are only available via coprophagy.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point No.)	Year	Title	Source	Justification
680	Kruger M. et al.	CA 5.8	2013	Glyphosate suppresses the antagonistic effect of Enterococcus spp. on Clostridium botulinum.	Anaerobe (2013), Vol. 20, pp. 74	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Moreover, the doses used in this study are not justified and are unrealistically high. Cultures are batch culture and it is unclear if conditions are to get values in growing phase. Comparisons between glyphosate and Roundup are completely different so they cannot be compared.
681	Lozano V. L. et al.	CA 5.8.2	2018	Sex-dependent impact of Roundup on the rat gut microbiome.	Toxicology reports (2018), Vol. 5, pp. 96	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study has a number of issues related to design: Rats are at the end of their life when feces were sampled. It is not clear of feces were sampled pre- or post mortem. Results are confounded by advanced age or even tumor status of these rats, predominantly mammary. The smaller than expected number of phyla may be related to age of the rats. Short-term responses are not surprising: cells in direct contact with a substance in a test tube (liquid medium) will respond differently than cells exposed to that same substance within their natural environment. So in vitro data usually show cells have a greater sensitivity to the substance than in vivo data. And within the intestinal environment there is much to dilute, diminish or mask the substance's effect. This diminished effect in vivo has been documented repeatedly for a large number of test substances.
682	Mao Q. et al.	CA 5.8.2	2018	The Ramazzini Institute 13-week pilot study on glyphosate and Roundup administered at human-equivalent dose to Sprague Dawley rats: effects on the microbiome.	Environmental Health (2018), Vol. 29, No. 17, pp 50	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In this publication there was no clinical evidence of alterations in activity or behavior in pups. Body weight, water and feed consumption both in dams and pups were no different across the groups. Litter sizes were fully comparable among groups. To identify changes in microbes with multiple analyses in groups of animals is not unexpected and not necessarily indicative of a specific effect of the active substance. Changes within all rats due to maturation are greater than the differences between treatment groups. Moreover there are several points limiting the significance of the results: 1) information to calculate dose is not in the paper and seems intentional, 2) ADI is not the same as exposure which averages 1% of the ADI, and clinical signs were by definition not observed at the NOAEL which is 100-fold greater than the ADI. Animals in these toxicity studies had gut microbes, 3) Claims of exposure via milk are unfounded. The statistical analysis results in some differences but they do not put these changes into the context of whether they are normal.

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point No.)	Year	Title	Source	Justification
683	Motta E. V. S. et al.	CA 8.3.1.2	2018	Glyphosate perturbs the gut microbiota of honey bees.	Proceedings of the National Academy of Sciences of the United States of America (2018), Vol. 115, No. 41, pp. 10305	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This papers describes exposure of bees to glyphosate and its impact on gut microbiota.
684	Nielsen L. N. c. r. et al.	CA 6.4	2017	Glyphosate has limited short-term effects on commensal bacterial community composition in the gut environment due to sufficient aromatic amino acid levels	Environmental pollution (2018), Vol. 233, pp. 364	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study shows that aromatic amino acids in culture conditions can negate impact on gut microbes from glyphosate because microbes with sensitive EPSPS can get these amino acids from the media.
685	Riede S. et al.	CA 6.4	2016	Investigations on the possible impact of a glyphosate-containing herbicide on ruminal metabolism and bacteria in vitro by means of the 'Rumen Simulation Technique'.	Journal of applied microbiology (2016), Vol. 121, No. 3, pp. 644	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In this study a system was developed for studying ruminal organisms that is dynamic, used mixed population of microbes, and is periodically fed with removal of waste products. There were no impacts of glyphosate formulation to this system.
686	Schrodl W. et al.	CA 6.4	2014	Possible effects of glyphosate on Mucorales abundance in the rumen of dairy cows in Germany.	Current microbiology (2014), Vol. 69, No. 6, pp. 817	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Methodological shortcomings of the approaches used reduce the significance of the results (rumen fungi are stricly anaerobic, but they use aerobic cultures; 2) spot-urine concentrations are highly affected by the level of milk production 3) the ELISA is not validated and the LOD ws not used, no validation is described for other assays.
687	Shehata A. A. et al.	CA 6.4	2014	Neutralization of the antimicrobial effect of glyphosate by humic acid in vitro.	Chemosphere (2014), Vol. 104, pp. 258	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. In the absence of a suitable dossier datapoint it was allocated to point CA 6.4 as it concerns livestock. However, it is important to note that it is not a residue study and does not provide any data on the transfer of residues from feed to food of animal origin.
688	Shehata A. A. et al.	CA 6.4	2013	The effect of glyphosate on potential pathogens and beneficial members of poultry microbiota in vitro.	Current microbiology (2013), Vol. 66, No. 4, pp. 350	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. The publication does not provide new information (potential effects on microorganims with sensitive EPSPS are well known) and real world conditions of the gut are not replicated (study conducted on minimal media; microorganisms exposed to extremely high doses of glyphosate (1000x); aged cultures inducing additional stress).

No	Author(s)	Data requirement (indicated by the corresponding CA / CP data point No.)	Year	Title	Source	Justification
689	Vicini J. L. et al.	CA 6.4	2019	Glyphosate in livestock: feed residues and animal health.	Journal of animal science (2019), Vol. 97, No. 11, pp. 4509	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. Review article.
690	Yang X. et al.	CA 8.2.8	2019	Effects of the glyphosate-based herbicide roundup on the survival, immune response, digestive activities and gut microbiota of the Chinese mitten crab, Eriocheir sinensis	Aquatic toxicology (2019), Vol. 214, pp. 105243	5.4.1 case c) Relevance cannot be determined: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. This study uses a high dose of roundup formulation. The surfactants in Roundup are known to be toxic to aquatic animals. This publication indicates a potentially significant decline in survivial due to Roundup. Therefore, results obtained for other endpoints beyond survival may be secondary to known toxicity of the surfactants.

Table 38: Articles excluded after detailed assessment (i.e. not relevant): sorted by technical section (and by author)

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
691	Ecotoxicology	Abalaka M. E. et al.	2015	Effects of pesticides on the micro-flora of loamy soil obtained from biological garden, federal university of technology, minna, Nigeria	Advance in Agriculture and Biology (2015), Vol. 4, No. 3, pp. 106-113	Presented data cannot be related to an EU level ANNEX I risk assessment (microbial population study).
692	Ecotoxicology	Abdulkareem S. I. et al.	2014	Effect of lethal and sub- lethal concentrations of glyphosate on some biochemical parameters and growth responses of African catfish (Clarias gariepinus).	Egyptian Academic Journal of Biological Sciences B Zoology (2014), Vol. 6, No. 2, pp. 47-54	Endpoints are not relatable to an EU level risk assessment. No information provided on the levels of exposure presented.
693	Ecotoxicology	Abraham J. et al.	2018	Commercially formulated glyphosate can kill non-target pollinator bees under laboratory conditions.	Entomologia Experimentalis et Applicata (2018), Vol. 166, No. 8, pp. 695-702	The study was conducted using Sunphosate 360 SL, which is not the representative formulation for the EU renewal at Annex I.
694	Ecotoxicology	Achiorno C. L. et al.	2018	Susceptibility of Chordodes nobilii (Gordiida, Nematomorpha) to three pesticides: Influence of the water used for dilution on endpoints in an ecotoxicity bioassay.	Environmental pollution (2018), Vol. 242, No. Pt B, pp. 1427-1435	This paper describes the conduct of aquatic toxicity assays using naturally collected waters from the countries of interest. Infection rate of hosts was also assessed as an endpoint. Roundup that contains POEA was also used in the study. This surfactant is not in the representative formulation for the Annex I renewal.
695	Ecotoxicology	Ada F. B. et al.	2013	Ganado-hepato-somatic index of Oreochromis niloticus sub adults exposed to some herbicides	International Journal of Aquaculture (2013), Vol. 3, No. 11	Endpoints based on gonadosomatic and hepatosomatic indeces are not used in the EU level ecotoxicological risk assessment for Annex I renewal.
696	Ecotoxicology	Afrifa A. A. et al.	2010	The effects of benomyl and glyphosate treated plant litter on nitrogen mineralization in mollisols.	West African Journal of Applied Ecology (2010), Vol. 17, pp. 143-152	In this study both glyphosate and a fungicide product are applied simultaneously to tomato plants. As this assesses combined effects this study is not relevant to the renewal of glyphosate.
697	Ecotoxicology	Agostini M. G. et al.	2020	Pesticides in the real world: The consequences of GMO-based intensive agriculture on native amphibians	Biological Conservation (2020), Vol. 241, Article ID 108355	This paper looks at the impact of mixtures of pestcides rather than single actives. Therefore it is not relevant to the EU renewal of glyphosate at EU level
698	Ecotoxicology	Ahemad M. et al.	2012	Evaluation of plant-growth-promoting activities of rhizobacterium and Pseudomonas putida under herbicide stress	Annals of microbiology (2012), Vol. 62, No. 4, pp. 1531-1540	This paper discusses the impact of herbicides on the plant growth promoting activities of of soil borne bacteria in the root zone. It is not relateable to an EU ecotoxicological risk assessment.
699	Ecotoxicology	Akcha F. et al.	2012	Genotoxicity of diuron and glyphosate in oyster spermatozoa and embryos.	Aquatic toxicology (2012), Vol. 106-107, pp. 104-13	Endpoints derived from genotoxic screening and based upon parameters not considered relevant to EU renewal level assessment.
700	Ecotoxicology	Albajes R. et al.	2011	Two heteropteran predators in relation to weed management in herbicide-tolerant corn.	Biological Control (2011), Vol. 59, No. 1, pp. 30-36	This study was not conducted to a relevant guideline. The test substance was identified as MON 78044, but no other test item information is provided (e.g. purity). The results of the study cannot clearly be related to the glyphosate treatments as multiple products were applied, the work is not GLP compliant and there is insufficient analytical documentation to confirm exposure.
701	Ecotoxicology	Alcantara-de la Cruz R. et al.	2017	Side-effects of pesticides on the generalist endoparasitoid Palmistichus elaeisis (Hymenoptera: Eulophidae).	Scientific Reports (2017), Vol. 7, No. 1, pp. 10064	This paper discusses the influence of trait modified crops sprayed with glyphosate on biological control agents. It is not relateable to an EU level risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
702	Ecotoxicology	Al-Daikh E. B. et al.	2016	Effect of glyphosate herbicide on the behavior of soil arthropods in non-organic tomato system	Advance in Agriculture and Biology (2016), Vol. 5, No. 1, pp. 14-19	Endpoints presented cannot be related to an EU level risk assessment for Annex I renewal.
703	Ecotoxicology	Allegrini M. et al.	2015	Ecotoxicological assessment of soil microbial community tolerance to glyphosate.	The Science of the total environment (2015), Vol. 533, pp. 60-8	Novel test design / approach - not relatable to an EU level ecotoxicological risk assessment for Annex I renewal.
704	Ecotoxicology	Allegrini M. et al.	2019	Suppression treatment differentially influences the microbial community and the occurrence of broad host range plasmids in the rhizosphere of the model cover crop Avena sativa L	PloS one (2019), Vol. 14, No. 10, pp. e0223600	Endpoints type is not considered at the EU level risk assessment and cannot be related to levels of exposure anticipated following application according to the proposed GAP.
705	Ecotoxicology	Allegrini M. et al.	2017	Repeated glyphosate exposure induces shifts in nitrifying communities and metabolism of phenylpropanoids	Soil biology & biochemistry (2017), Vol. 105, pp. 206-215	Approaches used cannot be related to an EU level ecotoxicological risk assessment for Annex I renewal.
706	Ecotoxicology	Alleva R. et al.	2016	Organic honey supplementation reverses pesticide-induced genotoxicity by modulating DNA damage response.	Molecular nutrition & food research (2016), Vol. 60, No. 10, pp. 2243-2255	Not related directly to the effects of glyphosate, but to the impact of polyphenols extracted from honey on human epithelial cells. Not relevant to EU level ecotoxicological risk assessment.
707	Ecotoxicology	Al-Sultany D. A. A. et al.	2019	Effects of contaminated water with glyphosate herbicides on the external and behavioral characteristics of common carp, Cyprinus Carpio Linnaeus.	Biochemical and Cellular Archives (2019), Vol. 19, No. 1, pp. 1475-1480	Methodology presented cannot be related to the results provided. Exposure rates cannot be related to the EU level assessment. No glyphosate formulation / product details presented.
708	Ecotoxicology	Amaral M. J. et al.	2012	The usefulness of mesocosms for ecotoxicity testing with lacertid lizards.	Acta Herpetologica (2012), Vol. 7, No. 2, pp. 263-280	Long term monitoring study on lizards maintained in outdoor mesocosms exposed to multiple pestcides. Endpoints cannot be related to an EU level ecotoxicological risk assessment for ANNEX I renewal of glyphosate.
709	Ecotoxicology	Amid C. et al.	2018	Additive effects of the herbicide glyphosate and elevated temperature on the branched coral Acropora formosa in Nha Trang, Vietnam.	Environmental science and pollution research international (2018), Vol. 25, No. 14, pp. 13360-13372	The paper discusses the combined impact of multiple stressors on coral bleaching, when exposed to a formulation that is not the representative formulation for the Annex I renewal. The study compares effects of the product on bleaching of corals at two different temperatures.
710	Ecotoxicology	Anbalagan C. et al.	2013	Use of transgenic GFP reporter strains of the nematode Caenorhabditis elegans to investigate the patterns of stress responses induced by pesticides and by organic extracts from agricultural soils.	Ecotoxicology (2013), Vol. 22, No. 1, pp. 72-85	Study provides information on cellular / molecular level and is not ecotoxicologically relevant study
711	Ecotoxicology	Antoniolli Z. I. et al.	2013	Heavy metal, pesticides and fuels: effect in the population of collembola in the soil. Original Title: Metais pesados, agrotoxicos e combustiveis: efeito na populacao de colembolos no solo.	Ciencia Rural (2013), Vol. 43, No. 6, pp. 992-998	Concerns exposure to a glyphosate formulation (not the representative formulation) in the presence of metals, and in mixtures. It is not relevant to an EU level risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
712	Ecotoxicology	Antunes S. C. et al.	2010	Structural effects of the bioavailable fraction of pesticides in soil: suitability of elutriate testing.	Journal of hazardous materials (2010), Vol. 184, No. 1-3, pp. 215-25	The endpoint cannot be ascertained for glyphosate alone as other active substances are also used in the field study. The glyphosate product used (Montana) is not a representative product.
713	Ecotoxicology	Armiliato N. et al.	2014	Changes in ultrastructure and expression of steroidogenic factor-1 in ovaries of zebrafish Danio rerio exposed to glyphosate.	Journal of toxicology and environmental health. Part A (2014), Vol. 77, No. 7, pp. 405-14	Endpoint cannot be related to an EU level risk assessment.
714	Ecotoxicology	Asgari S. M. et al.	2018	Oraganophosphorus pesticides induced enzymological responses in the various tissues of freshwater fish Koi carp (Cyprinus carpio)	European Journal of Zoological Research (2018), Vol. 6, No. 1, pp. 17-24	This study described the Biological impacts on enzyme levels in fish blood, are not used in an EU level ecotoxicological risk assessment.
715	Ecotoxicology	Avigliano L. et al.	2014	Effects of glyphosate on egg incubation, larvae hatching, and ovarian rematuration in the estuarine crab Neohelice granulata	Environmental Toxicology and Chemistry (2014), Vol. 33, no. 8, pp. 1879	Article discusses effects of formulated product on crab development. Endpoints are not relatable to an EU level risk assessment as specific endpoints are not discussed.
716	Ecotoxicology	Avigliano L. et al.	2018	Effects of Glyphosate on Somatic and Ovarian Growth in the Estuarine Crab Neohelice granulata, During the Pre-Reproductive Period	Water, air, and soil pollution (2018), Vol. 229, No. 2, pp. 44	Difficult to relate findings of the study to an EU level ecotoxicology risk assessment as they are based on GSI and HIS values and the different types of oocyte found in the ovaries between exposure groups.
717	Ecotoxicology	Ayanda I. O. et al.	2018	Toxicity of sublethal concentrations of glyphosate and paraquat herbicide in the African catfish (Clarias gariepinus)	International Journal of Agriculture and Biology (2018), Vol. 20, No. 6, pp. 1359-1364	Observations based on enzyme levels are not used in EU level ecotoxicological risk assessment for Annex I renewal purposes.
718	Ecotoxicology	Babalola O. O. et al.	2019	Mortality, teratogenicity and growth inhibition of three glyphosate formulations using Frog Embryo Teratogenesis Assay-Xenopus.	Journal of applied toxicology (2019), Vol. 39, No. 9, pp. 1257-1266.	This paper uses a formulation that is not the representative formulation for the annex I renewal. Study endpoints cannot be related to the EU level risk assessment as the techniques used are not recognised at the EU level.
719	Ecotoxicology	Bach N. C. et al.	2018	Effects of glyphosate and its commercial formulation, Roundup (R) Ultramax, on liver histology of tadpoles of the neotropical frog, Leptodactylus latrans (amphibia: Anura).	Chemosphere (2018), Vol. 202, pp. 289-297	Study conducted using a formulation that is not the representative formulation for the Annex I renewal. Roundup Ultramax is based on MON 78294, which contains a different surfactant system compared to the representative formulation (MON 52276) and therefore the effects of the surfactant cannot be excluded.
720	Ecotoxicology	Baier F. et al.	2016	Non-target effects of a glyphosate-based herbicide on Common toad larvae (Bufo bufo, Amphibia) and associated algae are altered by temperature.	PeerJ (2016), Vol. 4, pp. e2641	Test item used is not the representative formulation relevant to the EU renewal of glyphosate. The article discusses the impact of temperature on toxicity. Studies conducted for EU renewal are standardly conducted at a constant temperature that reflects median temperature in the field. Variable temperature studies are not considered at EU level.
721	Ecotoxicology	Baier F. et al.	2016	Temperature-Dependence of Glyphosate-Based Herbicide's Effects on Egg and Tadpole Growth of Common Toads	Frontiers in Environmental Science (2016), Vol. 4, pp. 51	The study was conducted using Roundup, which contains POEA and the influence of POEA on the achieved results cannot be excluded. The representative formulation for the Annex I renewal does not contain POEA, therefore the findings are not relevant to the renewal risk assessment.

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722	Ecotoxicology	Baker L. F. et al.	2014	The direct and indirect effects of a glyphosate-based herbicide and nutrients on Chironomidae (Diptera) emerging from small wetlands.	Environmental toxicology and chemistry (2014), Vol. 33, No. 9, pp. 2076-85	The formulation used in the article is not relevant to the Annex I renewal, as has a different surfactant system.
723	Ecotoxicology	Banaee M. et al.	2019	Acute exposure to chlorpyrifos and glyphosate induces changes in hemolymph biochemical parameters in the crayfish, Astacus leptodactylus (Eschscholtz, 1823).	Comparative biochemistry and physiology. Toxicology & pharmacology (2019), Vol. 222, pp. 145-155	Endpoints based on biochemical parameters are not relatable to an EU level ecotoxicological risk assessment for Annex I renewal.
724	Ecotoxicology	Bandara K. et al.	2015	Effect of glyphosate-based herbicide, Roundup super(TM) on territory deference of male Oreochromis mossambicus (Osteichthyes, Cichlidae) associated with mating behaviour	Sri Lanka journal of aquatic sciences (2015), Vol. 20, No. 1, pp. 1-10	Formulation tested contains POEA - not relevant to an EU level Annex I ecotoxicological risk assessment for renewal.
725	Ecotoxicology	Barbukho O. V. et al.	2011	Effect of herbicide Roundup on carp spawn viability and possibility for prevention of its toxicity by probiotic preparation BPS-44	Gidrobiologicheskii Zhurnal (2011), Vol. 47, No. 3, pp. 74-79	As Roundup was used in the study which contains surfactants not present in the representative formulation high concentrations were used, and eggs were exposed to both a probiotic and Roundup, this study is not relevant to the renewal of glyphosate.
726	Ecotoxicology	Bawa V. et al.	2018	Toxic effects of glyphosate on common carp (Cyprinus carpio L.) fingerlings.	Agricultural Research Journal (2018), Vol. 55, No. 1, pp. 169-171	The formulation used has a surfactant system that is based on POEA, which is not relevant to the EU representative formulation for the annex I renewal.
727	Ecotoxicology	Behrend J. E. et al.	2018	Contact with a glyphosate-based herbicide has long-term effects on the activity and foraging of an agrobiont wolf spider.	Chemosphere (2018), Vol. 194, pp. 714-721	Study used MON 8709 Buccaneer Plus formulation which contains MON 0818 (based on POEA) and is not used in the representative EU formulation. Therefore findings cannot be related to the risk assessment.
728	Ecotoxicology	Berger G. et al.	2018	How does changing pesticide usage over time affect migrating amphibians: a case study on the use of glyphosate-based herbicides in German agriculture over 20 years.	Frontiers in Environmental Science (2018), Vol. 6, article 6	This paper considers information from multiple sources to assess the impact of herbicides on amphibian populations in Germany over the last 20 years. This is country specific information that cannot be related to an EU level ecotoxicological risk assessment for EU Annex I renewal.
729	Ecotoxicology	Bernal-Rey D. L. et al.	2020	Seasonal variations in the dose-response relationship of acetylcholinesterase activity in freshwater fish exposed to chlorpyrifos and glyphosate.	Ecotoxicology and environmental safety (2020), Vol. 187, pp. 109673	No specific endpoints that are useable in an EU level ecotoxicological risk assessment for Annex I renewal are presented in the paper. It is difficult to relate the observed effects to fish species found in the EU, as these data were collected from wild caught fish collected over a period of time. Impacts for example, of pH on the levels of stress in the system were not considered and may have ultimately contributed to the observed effects.
730	Ecotoxicology	Berthelemy N. J.	2018	Effects of Glyphosate and Roundup on the brine shrimp Artemia franciscana	Integrative and comparative biology (2018), Vol. 58, Supp. 1, pp. E277-E277	This paper is a poster abstract. There is no associated paper. There is insufficient information presented in the poster abstract to establish relevance of the poster to the Annex I renewal.
731	Ecotoxicology	Bhojane N. M. et al.	2018	Individual and combined effect of indoxacarb and glyphosate on biochemical alterations in Japanese quails (Cuturnix Cuturnix Japonica)	Chemical Science Review and Letters (2018), Vol. 7, No. 25, pp. 190-200	Cellular level parameters are discussed in this paper, with endpoints that are not relevant to an Annex I renewal from an ecotoxicological perspective.

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732	Ecotoxicology	Blasco P. M. P. et al.	2018	Comparative study of chronic toxicity of herbicides used in South America using a model of Cyprinus carpio	Environmental Science: An Indian Journal (2018), Vol. 14, No. 5, pp. 175	Formulation used is not the representative formulation for the Annex I renewal.
733	Ecotoxicology	Boily M. et al.	2013	Acetylcholinesterase in honey bees (Apis mellifera) exposed to neonicotinoids, atrazine and glyphosate: laboratory and field experiments.	Environmental science and pollution research international (2013), Vol. 20, No. 8, pp. 5603-14	The test item is the commercial formulation Weathermax 240 which is distributed in Canada. This formulation is not the representative formulation for the Annex I renewal in the EU. In addition, the study does not follow any approved guideline and the investigated effect on acetylcholinesterase cannot be related to the EU level bee ecotoxicological risk assessment for Annex I renewal purposes. The field experiment, conducted in two regions in Québec (Canada) was not conducted under controlled conditions. No analytical verification of glyphosate was provided. Also, the experimental design is only briefly described, with no rationale presented for the selection of exposure concentrations.
734	Ecotoxicology	Bokony V. et al.	2017	Chronic exposure to a glyphosate-based herbicide makes toad larvae more toxic.	Proceedings. Biological sciences (2017), Vol. 284, No. 1858	The article does not report results which can be used for a risk assessment and information is insufficient to transfer values into such determinants.
735	Ecotoxicology	Bonfanti P. et al.	2018	A glyphosate micro-emulsion formulation displays teratogenicity in Xenopus laevis.	Aquatic toxicology (2018), Vol. 195, pp. 103-113	Formulation is not relevant to the EU level renewal of glyphosate.
736	Ecotoxicology	Bonnineau C. et al.	2012	Light history modulates antioxidant and photosynthetic responses of biofilms to both natural (light) and chemical (herbicides) stressors.	Ecotoxicology (2012), Vol. 21, No. 4, pp. 1208-24	Endpoints / findings not relatable to an EU level ecotoxicolgical risk assessment for Annex I renewal.
737	Ecotoxicology	Boscardin J. et al.	2016	Effects of different types of weed control on the ant fauna in Eucalyptus grandis. Original Title: Efeitos de diferentes tipos de controle de plantas infestantes sobre a mirmecofauna em Eucalyptus grandis.	Ciencia Florestal (2016), Vol. 26, No. 1, pp. 21-34	Specific endpoints that could be used in an EU level risk assessment were not presented.
738	Ecotoxicology	Boscardin J. et al.	2014	Relationship between ant communities and environmental quality in Eucalyptus grandis submitted to different weedy species control in the south of Brazil. Original Title: Relacao entre guildas de formigas e a qualidade ambiental em Eucalyptus grandis subme	ENTOMOTROPICA (2014), Vol. 29, No. 3, pp. 173-182	Presented data is not relatable to an EU level risk assessment for EU Annex I level renewal.
739	Ecotoxicology	Boufleuer E. M. S. et al.	2016	Assessment of mortality and reproduction of Daphnia magna subjected to the herbicide glyphosate. Avaliacao da mortalidade e reproducao de Daphnia magna submetida ao herbicida glifosato.	Acta Iguazu (2016), Vol. 5, No. 5, pp. 25-33	Results of a 48 hour Daphnia magna tests treated with glyphosate determined an LC50 of 2.1087 mg/L. A chronic (21 day) study determined effects at 2.1087 mg/L, but no effects were observed at the lower concentrations tested. The study was not conducted to GLP or to an acceptable guideline and there are several short comings in the provided report. The test substance used (Polaris 48%) is a Monsanto Brazil product that is based on

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						the IPA salt of Glyphosate. This product also contains a surfactant that is not relevant to the representative formulation, therefore the observed findings are not considered relevant to the renewal. Furthermore the influence of the co-formulant on the results cannot be excluded. There are no analytical data reported and so the exposure cannot be confirmed.
740	Ecotoxicology	Boutin C. et al.	2010	Measuring variability in phytotoxicity testing using crop and wild plant species.	Environmental toxicology and chemistry (2010), Vol. 29, No. 2, pp. 327-37	Glyphosate product + surfactant (Agral 90) was used in the study which compared this with an atrazine product to look at the phytotoxicity to plant species. Treatments ranged from 21 to 2277 g ai/ha for glyphosate product, applied in a greenhouse. Although an IC25 could be obtained from the article, the results indicate great variability between the plant species tested and external factors. Therefore, it is not possible to extrapolate from this data for use in the regulatory risk assessment in the glyphosate renewal.
741	Ecotoxicology	Boutin C. et al.	2019	Effects of sub-lethal doses of herbicides on the competitive interactions between two non-target plants: Centaurea cyanus L. and Silene noctiflora L.	Environmental toxicology and chemistry (2019), Vol . 8, No. 9, pp. 2053-2064	Observation not linked to glyphosate or its metabolites. In this case the observations were concerning competition in the growth of plants under different pesticide stress regimes and at different planting densities. Endpoints considered relevant for EU level risk assessment were not presented.
742	Ecotoxicology	Boutin C. et al.	2014	Herbicide impact on non-target plant reproduction: What are the toxicological and ecological implications?	ENVIRONMENTAL POLLUTION (2014), Vol. 185, pp. 295-306	This paper describes the results of a set of long term monitoring studies that were used to investigate the impact of a range of herbicides on the reproductive output of plants. Whilst these data are interesting in developing the testing paradigm for plants, the data presented cannot be related to an EU level risk assessment for Annex I renewal.
743	Ecotoxicology	Bridi D. et al.	2017	Glyphosate and Roundup(®) alter morphology and behavior in zebrafish.	Toxicology (20171), Vol. 392, pp. 32-39	The article does not report results, which can be used for risk assessment and information is insufficient to transfer values into such determinants.
744	Ecotoxicology	Bruckner A. et al.	2019	Foliar Roundup application has minor effects on the compositional and functional diversity of soil microorganisms in a short-term greenhouse experiment.	Ecotoxicology and environmental safety (2019), Vol. 174, pp. 506-513	Formulation used is not the representative formulation for the Annex I renewal.
745	Ecotoxicology	Buch A. C. et al.	2013	Toxicity of three pesticides commonly used in Brazil to Pontoscolex corethrurus (Mueller, 1857) and Eisenia andrei (Bouche, 1972)	Applied soil ecology (2013), Vol. 69, pp. 32-38	The formulation used is not the representative formulation for the Annex I.
746	Ecotoxicology	Buck J. C. et al.	2015	Effects of pesticide mixtures on host-pathogen dynamics of the amphibian chytrid fungus	PLoS One (2015), Vol. 10, No. 7, pp. e0132832/1	Effects on host pathogen dynamics is not a data requirement for the Annex I submission, Therefore, the findings cannot be related to the ecotoxicological risk assessment.
747	Ecotoxicology	Burella P. M. et al.	2018	Oxidative damage and antioxidant defense in Caiman latirostris (Broad-snouted caiman) exposed in ovo to pesticide formulations.	Ecotoxicology and environmental safety (2018), Vol. 161, pp. 437-443	Formulation used is not the representative formulation for the Annex I renewal.

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748	Ecotoxicology	Canosa I. S. et al.	2018	Ovarian growth impairment after chronic exposure to Roundup Ultramax® in the estuarine crab Neohelice granulata.	Environmental science and pollution research international (2018), Vol. 25, No. 2, pp. 1568-1575	Roundup Ultramax is the formulation used which contains 600 g/L a.e. This is however, not the representative formulation for the renewal.
749	Ecotoxicology	Canosa I. S. et al.	2019	Imbalances in the male reproductive function of the estuarine crab Neohelicegranulata, caused by glyphosate.	Ecotoxicology and environmental safety (2019), Vol. 182, pp. 109405	The test substance is a 400 g a.i./L formulation that is not the representative formulation for the Annex I renewal.
750	Ecotoxicology	Carmo E. L. et al.	2010	Pesticide selectivity for the insect egg parasitoid Telenomus remus	BioControl (2010), Vol. 55, No. 4, pp. 455-464	An IOBC guideline criteria was used for classification of three different glyphosate products used as test substances alongside several other insecticides and herbicides in this comparison lab study. Endpoints generated are not relevant to the renewal of glyphosate.
751	Ecotoxicology	Carpenter J. K. et al.	2016	The effect of two glyphosate formulations on a small, diurnal lizard (Oligosoma polychroma).	Ecotoxicology (2016), Vol. 25, No. 3, pp. 548-54	Contains POEA surfactant, therefore is not relevant to EU renewal.
752	Ecotoxicology	Carranza C. S. et al.	2014	Influence of the pesticides glyphosate, chlorpyrifos and atrazine on growth parameters of nonochratoxigenic Aspergillus section Nigri strains isolated from agricultural soils.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2014), Vol. 49, No. 10, pp. 747-55	Comparative growth rates of Apsergillus niger following application of different pesticides. Endpoints are not relatable to an EU level Annex I ecotoxicological risk assessment.
753	Ecotoxicology	Castilho A. F. et al.	2016	The impact of glyphosate herbicides on soil microbial activity from the Carajas National Forest.	Revista de Ciencias Agrarias / Amazonian Journal of Agricultural and Environmental Sciences (2016), Vol. 59, No. 3, pp. 302-309	A long term monitoring study using multiple Roundup formulations was performed. Roundup original contains POEA as a surfactant and is not therefore relevant. The other Roundup formulations differ in their composition to the representative formulation for the Annex I renewal.
754	Ecotoxicology	Chen L. et al.	2012	The combined effects of UV-B radiation and herbicides on photosynthesis, antioxidant enzymes and DNA damage in two bloom-forming cyanobacteria.	Ecotoxicology and environmental safety (2012), Vol. 80, pp. 224-30	Paper discusses the effect of glyphosate at different UV-B levels. Direct effects are not discussed. Not relatable to EU level risk assessment.
755	Ecotoxicology	Choi C. J. et al.	2012	Rapid effects of diverse toxic water pollutants on chlorophyll a fluorescence: variable responses among freshwater microalgae.	Water research (2012), Vol. 46, No. 8, pp. 2615-26	This article looks at effects of glyphosate + other compounds on the PSII system, determiningeffects to Chlorophyll A levels using fluorescence. Endpoints were generated using a novel approach that is not considered relevant to an EU level ecotoxicological risk assessment.
756	Ecotoxicology	Zanuncio C. J. et al.	2018	Glyphosate-based herbicides toxicity on life history parameters of zoophytophagous Podisus nigrispinus (Heteroptera: Pentatomidae)	Ecotoxicology and environmental safety (2018), Vol. 147, pp. 245-250	Based on an exposure situation where soldier bugs ere exposed on glyphosate resistant crops, which are not relevant to the EU exposure situation.
757	Ecotoxicology	Condrosari P. et al.	2018	Growth inhibition test of glyphosate herbicide for glyphosate-degrading-bacteria screening	International Journal of ChemTech Research (2018), Vol. 11, No. 5, pp. 240-248	The paper describes a screening test for establishing bacterial populations as tools for remediation of soils. The presented endpoints are not relatable to an EU level risk assessment from an ecotoxicological perspective.

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758	Ecotoxicology	Costa R. N. et al.	2016	Measuring the impacts of Roundup Original® on fluctuating asymmetry and mortality in a Neotropical tadpole	Hydrobiologia (2016), Vol. 765, No. 1, pp. 85-96	Formulation tested contains POEA which is not relevant in the EU, as the representative formulation does not contain POEA.
759	Ecotoxicology	Cuhra M. et al.	2013	Clone- and age-dependent toxicity of a glyphosate commercial formulation and its active ingredient in Daphnia magna.	Ecotoxicology (2013), Vol. 22, No. 2, pp. 251-62	Study was performed according to methods adapted from the ISO, US EPA and the OECD Testing. Juveniles > 24 hour old are not the approach advised in any of the test guidelines, so the acute results for the aged cohort studies cannot be related to an EU level risk assessment. Concerning the chronic exposure assay, this approach was modified from the guidelines stated above, extending beyond the 21 day duration of the guideline test. Validity criteria for the acute and chronic test were not stated. Details of the methods used to prepare the test media are not reported. Biological data are not reported for all age groups, so the data presented in the plots cannot be confirmed. The test organisms used in the tests were from different natural sources and poorly characterised as it would be needed to draw a regulatory relevant conclusion from the reported results. Furthermore and more critically, analytical dose confirmation of media in the vessels was not performed, so exposure cannot be confirmed. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
760	Ecotoxicology	Currie Z. et al.	2015	Toxicity of Cuspide 480SL® spray mixture formulation of glyphosate to aquatic organisms.	Environmental toxicology and chemistry (2015), Vol. 34, No. 5, pp. 1178-84	The main focus of the article was a hazard assessment of two glyphosate formulations not available in Europe and the associated co-formulants. The study, measured toxicity values and calculated exposure values for South America. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
761	Ecotoxicology	da Costa Chaulet F. et al.	2019	Glyphosate- and Fipronil-Based Agrochemicals and Their Mixtures Change Zebrafish Behavior.	Archives of environmental contamination and toxicology (2019), Vol. 77, No. 3, pp. 443-451	This paper describes behavioural differences in zebra fish when exposed to either glyphosate or fipronil. No endpoint data presented could be used in an EU level for Annex I ecotoxicological risk assessment. Aversion / avoidance testing is not an EU level ecotoxicology risk assessment data requirement.
762	Ecotoxicology	da Rosa J. G. S. et al.	2016	Fish Aversion and Attraction to Selected Agrichemicals.	Archives of environmental contamination and toxicology (2016), Vol. 71, No. 3, pp. 415-22	Paper describes a novel fish avoidance study which is not considered relevant to an EU level risk assessment.
763	Ecotoxicology	da Silva G. S. et al.	2019	Gene expression, genotoxicity, and physiological responses in an Amazonian fish, Colossoma macropomum (CUVIER 1818), exposed to Roundup and subsequent acute hypoxia	Comparative Biochemistry and Physiology, Part C: Toxicology & Pharmacology (2019), Vol. 222, pp. 49-58	The formulation used is based on MON 2139, which contains POEA. POEA surfactants are not present in the representative formulation (MON 52276) being used for the Annex I renewal.
764	Ecotoxicology	da Silva R. A. et al.	2013	Compatibility of conventional agrochemicals used in rice crops with the entomopathogenic fungus Metarhizium anisopliae.	Scientia Agricola (2013), Vol. 70, No. 3, pp. 152-160	This paper presents the results of an agrochemical mixture study to entompathogenic fungus. As the study was performed using a mixture the appropriate endpoints for glyphosate cannot be determined.

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765	Ecotoxicology	Dalton R. L. et al.	2010	Comparison of the effects of glyphosate and atrazine herbicides on nontarget plants grown singly and in microcosms.	Environmental toxicology and chemistry (2010), Vol. 29, No. 10, pp. 2304-15	A study to look at the effects of Glyphosate (Roundup original + surfactant, 356 g/L) on single potted plant species compared with a microcosm. Based on relevant guidelines, six doses of up to 2136 g ai/ha label rate. IC25 results generated were used to compare test systems, however it is not possible to extrapolate to the risk assessments in the glyphosate renewal. Additionally, due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
766	Ecotoxicology	de Brito Rodrigues L. et al.	2017	Ecotoxicological assessment of glyphosate-based herbicides: Effects on different organisms.	Environmental toxicology and chemistry (2017), Vol. 36, No. 7, pp. 1755-1763	The aim of the work presented in this paper was to evaluate the toxicity and potential effects of two glyphosate formulations on seed germination, brine shrimp and zebra fish larvae. The selected test species and design are not relatable to an EU level ecotoxicological risk assessment, as a USEPA approach was followed for a mixed consideration of diverse test species. The report provides insufficient description of study design and no specific rationale was cited for the formulations selected. Some methodology was performed according to OECD guidelines, however validity criteria were not evaluated and no analytical verification was performed.
767	Ecotoxicology	de Moraes C. P. et al.	2019	Hormetic effect of glyphosate on Urochloa decumbens plants.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2019), Vol. 55, No. 4, pp. 376-381	This paper presents a summary and review of hormetic growth response papers. No supportive data was presented to support stated endpoints.
768	Ecotoxicology	de Saraiva A. S. et al.	2016	Glyphosate sub-lethal toxicity to non-target organisms occurring in Jatropha curcas plantations in Brazil.	Experimental & applied acarology (2016), Vol. 70, No. 2, pp. 179-87	Endpoints not relatable to an EU level ecotoxicological risk assessment.
769	Ecotoxicology	de Sousa Saraiva A. et al.	2015	Weed management practices affect the diversity and relative abundance of physic nut mites.	Experimental & applied acarology (2015), Vol. 65, No. 3, pp. 359-75	The paper describes a long term monitoring programme looking at weed management practices and their impact on mite species in a particular region of Brazil, that cannot be related to an EU level risk assessment.
770	Ecotoxicology	De Souza Filho J. et al.	2013	Mutagenicity and genotoxicity in gill erythrocyte cells of Poecilia reticulata exposed to a glyphosate formulation.	Bulletin of environmental contamination and toxicology (2013), Vol. 91, No. 5, pp. 583-7	Methods and endpoints are not relevant to an EU level ecotoxicology assessment.
771	Ecotoxicology	De Stefano L. G. et al.	2018	Comparative impact of two glyphosate-based formulations in interaction with Limnoperna fortunei on freshwater phytoplankton	Ecological indicators (2018), Vol. 85, pp. 575-584	This paper looks at the interaction of herbicide formulations in conjunction with the presence of mussels on the development of periphyton and phytoplankton communities. As the effects cannot be related directly to the single active substance, this paper is not considered relevant for the EU level Ecotoxicological risk assessment for Annex I renewal.
772	Ecotoxicology	Debski H. et al.	2018	Effects of glyphosate and fluazifop-P-butyl on flavonoids content and growth of common buckwheat (Fagopyrum esculentum Moench)	Fresenius Environmental Bulletin (2018), Vol. 27, No. 1, pp. 91-97	Cellular level parameters discussed in the paper, with endpoints that are not relevant to an Annex I renewal from an ecotoxicological perspective.

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773	Ecotoxicology	Debski H. et al.	2018	Comparison of the response of seedlings of common buckwheat (Fagopyrum esculentum Moench) to glyphosate applied to the shoot or to the root zone.	Acta Agrobotanica (2018), Vol. 71, No. 1, pp. Article No.: 1730	Unable to establish the exposure rates used in the three different tests. mMolar solutions were prepared, but no attempt has been made to confirm dosing and no analysis performed. Endpoints are therefore not relevant to an EU level risk assessment from an ecotoxicological perspective.
774	Ecotoxicology	Di Fiori E. et al.	2012	Impact of the invasive mussel Limnoperna fortunei on glyphosate concentration in water.	Ecotoxicology and environmental safety (2012), Vol. 81, pp. 106-13	Paper describes the use of golden mussels for removal of glyphosate from the water column. Endpoints presented cannot be be used in EU level Annex I renewal risk assessment.
775	Ecotoxicology	Dinehart S. K. et al.	2010	Acute and chronic toxicity of Roundup Weathermax and Ignite 280 SL to larval Spea multiplicata and S. bombifrons from the Southern High Plains, USA.	Environmental pollution (2010), Vol. 158, No. 8, pp. 2610-7	Roundup Weathermax was used as a test item.The composition differs to that of the representative formulation for the Annex I renewal (MON 52276), and thus the results cannot be applied to the risk assessment for the EU renewal. Due to the test material not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
776	Ecotoxicology	do Carmo E. L. et al.	2010	SELECTIVITY OF PESTICIDES USED IN SOYBEAN CROPS TO TRICHOGRAMMA PRETIOSUM RILEY, 1879 (HYMENOPTERA: TRICHOGRAMMATIDAE) PUPAE. Original Title: SELETIVIDADE DE PRODUTOS FITOSSANITARIOS UTILIZADOS NA CULTURA DA SOJA PARA PUPAS DE TRICHOGRAMMA PRETIOSUM RILEY	Arquivos do Instituto Biologico Sao Paulo (2010), Vol. 77, No. 2, pp. 282-290	Effects on parasitoid wasps via exposure of parasitised eggs which were immersed for 5 sec in test solutions. However, this is no adequate route of exposure and the content of active ingredient per area is unclear. Therefore the biological results cannot be attributed to a specific test concentration.
777	Ecotoxicology	Dos Santos A. P. R. et al.	2017	A glyphosate-based herbicide induces histomorphological and protein expression changes in the liver of the female guppy Poecilia reticulata.	Chemosphere (2017), Vol. 168, pp. 933-943	The paper attempts to establish a proteomic method for detecting sub-lethal impacts of chemicals on fish. This is not relevant for risk assessment in the EU, where growth and reproductive parameters achieved in higher tier fish testing are considered. The formulation used is also not the representative formulation for the annex I renewal.
778	Ecotoxicology	Dos Santos Teixeira J. M. et al.	2018	Acute toxicity and effects of Roundup Original® on pintado da Amazonia.	Environmental science and pollution research international (2018), Vol. 25, No. 25, pp. 25383-25389	Endpoints presented were for a formulation that is not the representative formulation for the Annex I renewal.
779	Ecotoxicology	Druart C. et al.	2012	Landsnail eggs bioassays: A new tool to assess embryotoxicity of contaminants in the solid, liquid or gaseous phase of soil	Applied soil ecology (2012), Vol. 53, pp. 56-64	Endpoints are not applicable to EU level ecotoxicology risk assessment. Approach described is novel and not validated.
780	Ecotoxicology	Druille M. et al.	2015	Glyphosate vulnerability explains changes in root-symbionts propagules viability in pampean grasslands	Agriculture, ecosystems & environment (2015), Vol. 202, pp. 48-55	Findings cannot be related to an EU level ecotoxicological risk assessment.
781	Ecotoxicology	Druille M. et al.	2013	Arbuscular mycorrhizal fungi are directly and indirectly affected by glyphosate application	Applied soil ecology (2013), Vol. 72, pp. 143-149	Describes an experiment to establish if fungal hyphae associated with plant roots are affected by glyphosate. Endpoints achieved not relatable to EU level risk assessment. Exposure rates cannot be determined from the paper.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
782	Ecotoxicology	Du X. et al.	2012	Effects of eight herbicides on seed germination and seedling growth of Scutellaria baicalensis Georg	Xibei Nongye Xuebao (2012), Vol. 21, No. 4, pp. 202-206	The formulation (Glyphosate (Baron®) 48% SL (Elhelb), is not the representative formulation for the EU Annex I renewal. The study was not conducted to GLP and/or according to a recognized test guideline and there are no validity criteria presented. The authors state that Roundup had no effect on the germination of Scutellaria baicalensis Georgi seeds in laboratory petri dish test but inhibited the growth of Scutellaria baicalensis Georgi seedlings. However, given the lack of standard guidelines and important material and application methods, in conjunction with insufficiently reported test conditions and biological data, no useful endpoint for the risk assessment can be derived.
783	Ecotoxicology	Dumitru G. et al.	2019	Effect of glyphosate herbicide on some hematological and biochemical parameters in Carassius auratus L	Revista de Chimie (2019), Vol. 70, No. 2, pp. 518-521	Sub-lethal effects on blood chemistry parameters are not relevant to an ecotoxicological risk assessment for the EU level renewal of glyphosate. On review of the report, the formulation was also a 48% a.e. content, with reasons for the observed effects related to POEA in the formulation described in the results. The representative formulation does not contain POEA, therefore results not relevant for the EU.
784	Ecotoxicology	Edge C. B. et al.	2013	Laboratory and field exposure of two species of juvenile amphibians to a glyphosate-based herbicide and Batrachochytrium dendrobatidis.	The Science of the total environment (2013), Vol. 444, pp. 145-52	Formulation used is not the representative formulation for the Annex I renewal. Effects from co-formulants cannot be excluded.
785	Ecotoxicology	Edge C. B. et al.	2012	A silviculture application of the glyphosate-based herbicide VisionMAX to wetlands has limited direct effects on amphibian larvae.	Environmental toxicology and chemistry (2012), Vol. 31, No. 10, pp. 2375-83	The formulation used is not the representative formulation for the Annex I renewal. Effects from co-formulants cannot be excluded.
786	Ecotoxicology	Edge C. et al.	2014	Variation in amphibian response to two formulations of glyphosate-based herbicides.	Environmental toxicology and chemistry (2014), Vol. 33, No. 11, pp. 2628-32	Roundup WeatherMax and Roundup Weed and Grass Control, which are non EU representative glyphosate formulated products were used as the test substances. Prior exposure history to other chemicals and other organisms within their natural environment was unknown. Several limitations were observed within the study including lack of exposure history of the local organisms, inability to attribute the results entirely to the test substance, inability to develop a dose-response relationship or derive end-points within the study, the analytical approach and verification was lacking, and the study was not conducted according to a standard guideline.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
787	Ecotoxicology	Edge C. et al.	2014	The response of amphibian larvae to exposure to a glyphosate-based herbicide (Roundup WeatherMax) and nutrient enrichment in an ecosystem experiment.	Ecotoxicology and environmental safety (2014), Vol. 109, pp. 124-32	WeatherMax, a non EU representative glyphosate formulated product was used as the test substance. Prior exposure history of the egg masses to other chemicals as well as other organisms within the wetlands was unknown as the study was conducted in a natural environment. Several limitations were observed within the study including lack of exposure history of the local organisms, inability to attribute the results entirely to the test substance, inability to develop a dose-response relationship within the study. Testing conditions were neither documented nor controlled, and representativeness of the test conditions were unknown as the study was not conducted according to a standard guideline.
788	Ecotoxicology	El Sebai O. A. et al.	2012	Side-effect of certain herbicides on egg parasitoid Trichogramma evanescens (West.) (Hymenoptera: Trichogrammatidae)	Academic Journal of Entomology (2012), Vol. 5, No. 1, pp. 1-10	The aim of the study was to compare the toxicity of four different commercially available herbicidal products to T. evanescens. Glyphosate was classified as harmless to T. evanescens wasps. The study was not conducted to a guideline or to GLP and the study design lacks some details compared with relevant guidelines. The test concentrations are based on nominal and no analytical verifications of test item concentrations were conducted. Only some details of the statistical analysis are reported. As the study is based on a glyphosate product, the toxicity of glyphosate active substance alone is unknown and therefore endpoints generated from this study are not quantifiable. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
789	Ecotoxicology	Enemaduku A. M. et al.	2015	Effects of pesticides on the micro-flora of loamy soil obtained from Biological Garden, Federal University of Technology, Minna, Nigeria	Journal of Scientific and Engineering Research (2015), Vol. 2, No. 4, pp. 55-63	This monitoring study based on a Nigerian soil type, uses endpoints that are not applicable to an EU level ecotoxicological risk assessment.
790	Ecotoxicology	Erban T. et al.	2017	Detection of the desiccant and plant growth regulator chlormequat in honeybees and comb pollen.	Veterinarni Medicina (2017), Vol. 62, No. 11, pp. 596-603	Investigation of samples from hives exhibiting poisoning. Analyzed many pesticides (including glyphosate). No glyphosate detections reported.
791	Ecotoxicology	Faghani M.	2018	Effect of glyphosate on honey bee (Apis Mellifera) performance	Arthropods (2018), Vol. 7, No. 3, pp. 77-81	Presents no data that can be used in an EU based risk assessment.
792	Ecotoxicology	Fai P. B. A. et al.	2015	Potential of the microbial assay for risk assessment (MARA) for assessing ecotoxicological effects of herbicides to non-target organisms.	Ecotoxicology (2015), Vol. 24, No. 9, pp. 1915-22	Novel test design / approach - not relatable to an EU level ecotoxicological risk assessment for Annex I renewal.
793	Ecotoxicology	Faita M. R. et al.	2018	Changes in hypopharyngeal glands of nurse bees (Apis mellifera) induced by pollen-containing sublethal doses of the herbicide Roundup	Chemosphere (2018), Vol. 211, pp. 566-572	This test was conducted using Roundup Original which contains POEA and is not therefore relevant to the EU level risk assessment for ANNEX I renewal.
794	Ecotoxicology	Falis M. et al.	2014	Effects of heavy metals and pesticides on survival of Artemia franciscana.	Acta Veterinaria Brno (2014), Vol. 83, No. 2, pp. 95-99	This paper presents data for a formulation that cannot be related to an EU level risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
795	Ecotoxicology	Fan J. et al.	2013	Hydroxyl radical generation and oxidative stress in Carassius auratus exposed to glyphosate and its formulation	Toxicological and environmental chemistry (2013), Vol. 95, No. 7, pp. 1183-1191	Contains POEA, therefore not relevant to EU renewal.
796	Ecotoxicology	Fan J. Y. et al.	2013	Herbicide Roundup® and its main constituents cause oxidative stress and inhibit acetylcholinesterase in liver of Carassius auratus	Journal of environmental scienc and health, Part B. Pesticides, food contaminants and agricultural wastes (2013), Vol. 48, No. 10, pp. 844-850	Contains POEA, therefore not relevant to EU renewal.
797	Ecotoxicology	Farabaugh N. F. et al.	2014	Behavioral responses of the Strawberry Poison Frog (Oophaga pumilio) to herbicide olfactory cues: possible implications for habitat selection and movement in altered landscapes.	Canadian Journal of Zoology (2014), Vol. 92, No. 11, pp. 979-984	Endpoints based on avoidance behaviour are not used in the ecotoxicological risk assessment for the Annex I renewal purposes.
798	Ecotoxicology	Farina W. M. et al.	2019	Effects of the Herbicide Glyphosate on Honey Bee Sensory and Cognitive Abilities: Individual Impairments with Implications for the Hive.	Insects (2019), Vol. 10, No. 10, pp. E354	This is a review article. No data presented that is supported.
799	Ecotoxicology	Fedorova N. V. et al.	2019	Influence of glyphosate on the morphogenesis and biochemical indicators of onions and wheat.	Zashchita i Karantin Rastenii (2019), No. 9, pp. 47-48	Article concerns the effect of herbicide use on the nutrient content of wheat and onions. The endpoints / observations are not relatable to an EU level ecotoxicological risk assessment for Annex I renewal.
800	Ecotoxicology	Felix F. J. et al.	2015	Impact of the herbicide glyphosate roundup (41%) on the haematology of the freshwater fish, Catla catla (Hamilton)	IOSR Journal of Environmental Science, Toxicology and Food Technology (2015), Vol. 9, No. 4-3, pp. 56-60	Contains POEA, therefore not relevant to EU renewal.
801	Ecotoxicology	Felix F. J. et al.	2018	Efficacy of herbicide glyphosate Hijack on the blood parameters of the freshwater fish, Catla catla (HAM)	Asian Journal of Biology (2018), Vol. 7, No. 2, pp. 38848	Biological impacts on enzyme levels in blood are not used in an EU level ecotoxicological risk assessment.
802	Ecotoxicology	Felline S. et al.	2019	The response of the algae Fucus virsoides (Fucales, Ochrophyta) to Roundup® solution exposure: A metabolomics approach.	Environmental pollution (2019), Vol. 254, No. Pt A, pp. 112977	Novel approach utilising metabolomics. The latter is not used in EU level risk assessment for Annex I renewal and is thusnot releatable to the risk assessment.
803	Ecotoxicology	Ferreira E. A. et al.	2015	Cassava physiological responses to the application of herbicides. Respostas fisiologicas da mandioca a aplicacao de herbicidas.	Semina: Ciencias Agrarias (2015), Vol. 36, No. 2, pp. 645-655	Endpoints not relatable to an EU level ecotoxicological risk assessment for Annex I renewal.
804	Ecotoxicology	Ferreira-Junior D. F. et al.	2017	Low Concentrations of Glyphosate-Based Herbicide Affects the Development of Chironomus xanthus	Water, air, and soil pollution (2017), Vol. 228, No. 10, 390 p	The purpose of the study was to test acute and chronic toxicity of Roundup® Original to a tropical fresh water midge. Roundup Original contains POEA surfactant which is not permitted for use in formulations in the EU. The representative formulation (MON 52276) does not contain POEA. The influence of the surfactant on the achieved results in this study cannot be excluded. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
805	Ecotoxicology	Figueiredo J. et al.	2014	Effects of four types of pesticides on survival, time and size to metamorphosis of two species of tadpoles (Rhinella marina and Physalaemus centralis) from the southern Amazon, Brazil.	Herpetological Journal (2014), Vol. 24, No. 1, pp. 7-15	The aim of the work presented in the paper was to evaluate the effects of four commonly applied herbicides on the survival and development on amphibians in Brazil. It was stated by the authors that standard fish surrogate endpoint data may not be directly applicable to Brazil's amphibian species. Thus the local species selected, and testing approach used are not directly relatable to an EU level ecotoxicological risk assessment for Annex I renewal purposes. Furthermore, the acute and chronic toxicity tests were not conducted according to any recognised test guideline with neither specific validity criteria nor animal welfare considered. The frog eggs were collected from temporary ponds in Southern Amazonia, where previous exposure of the eggs to other chemicals in the environment is unclear. The eggs were hatched in rainwater, without measured water quality characteristics. The test item selected for glyphosate was a local glyphosate formulation (480 g/L). The effect of glyphosate on metamorphosis was inconclusive. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
806	Ecotoxicology	de Souza Filho J. et al.	2013	Toxicological effects of a glyphosate-based formulation on the liver of Poecilia reticulata	Current Topics In Toxicology (2013), Vol. 9, pp. 81-91	The study was performed to assess the acute mortality (based on OECD 203) and sub-lethal effects (including histopathology). The study lacks several experimental standard procedures (e.g. analytical verification, reporting of validity criteria). Furthermore the formulation (Roundup Transorb) is not the representative formulation for the EU Annex I renewal (MON 52276) that contains POEA, a co-formulant that is not permitted in formulations in the EU. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
807	Ecotoxicology	Filippov A. A. et al.	2019	Effect of Roundup Herbicide on the Temperature Characteristics of Maltase of the Intestinal Mucosa in Juvenile Fish	INLAND WATER BIOLOGY (2019), Vol. 12, No. 2, pp. 248-253	Enzymatic impacts resulting from exposure are not considered in the EU level ecotoxicological risk assessment for Annex I renewal. It is extremely difficult to relate the findings to an EU level exposure scenario.
808	Ecotoxicology	Fiorino E. et al.	2018	Effects of glyphosate on early life stages: comparison between Cyprinus carpio and Danio rerio.	Environmental science and pollution research international (2018), Vol. 25, No. 9, pp. 8542-8549	This paper is a poster abstract with no associated paper. There is insufficient information presented in the poster abstract to establish relevance of the poster to the Annex I renewal.
809	Ecotoxicology	Frontera J. L. et al.	2014	Effects of glyphosate and polyoxyethylene amine on metabolic rate and energy reserves of Procambarus clarkii juveniles.	Open Environmental Sciences (2014), Vol. 8, pp. 49-53	Contains POEA, therefore not relevant to EU renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
810	Ecotoxicology	Fuentes L. et al.	2011	Comparative toxicity of two glyphosate formulations (original formulation of Roundup® and Roundup WeatherMAX®) to six North American larval anurans.	Environmental toxicology and chemistry (2011), Vol. 30, No. 12, pp. 2756-61	The original formulation of Roundup and Roundup WeatherMAX are not the representative formulation for the Annex I renewal. The original formulation of Roundup used, contains a POEA surfactant, which is not permitted for use in the EU. The test design is well described in the paper, but due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
811	Ecotoxicology	Gagneten A. M. et al.	2014	EFECTOS DEL HERBICIDA RON-DO® SOBRE Cerodaphnia reticulata (CRUSTACEA, CLADOCERA) Y DEGRADABILIDAD DEL GLIFOSATO (N-FOSFOMETILGLICINA) EN CONDICIONES EXPERIMENTALES	Natura Neotropicalis (2014), Vol. 45, No. 1&2, pp. 71-85	Formulation is not the representative formulation for the Annex I EU renewal.
812	Ecotoxicology	Gahl M. K. et al.	2011	Effects of chytrid fungus and a glyphosate-based herbicide on survival and growth of wood frogs (Lithobates sylvaticus).	Ecological applications (2011), Vol. 21, No. 7, pp. 2521-9	Toxicity of glyphosate products to wild wood frogs and chytrid fungus are assessed.. The study was conducted in Canada. Endpoints do not lend themselves to the EU renewal of glyphosate.
813	Ecotoxicology	Galin R. R. et al.	2019	Effect of Herbicide Glyphosate on Drosophila melanogaster Fertility and Lifespan.	Bulletin of experimental biology and medicine (2019), Vol. 167, No. 5, pp. 663-666	The formulation used (GLYPHOS) contains POEA which is not relevant to the EU level ecotoxicological risk assessment for Annex I renewal, as the representative formulation does not contain POEA, which is a known surfactant this is known to be more toxic than glyphosate.
814	Ecotoxicology	Garcia-Espineira M. et al.	2018	Toxicity of atrazine- and glyphosate-based formulations on Caenorhabditis elegans.	Ecotoxicology and environmental safety (2018), Vol. 156, pp. 216-222	The formulated product used in the test contains MON 2139 which contains POEA (MON0818). Therefore findings are not relevant to the EU level andrepresentative formulation for the Annex I renewal.
815	Ecotoxicology	Garcia-Perez J. A. et al.	2016	Impact of litter contaminated with glyphosate-based herbicide on the performance of Pontoscolex corethrurus, soil phosphatase activities and soil pH	Applied soil ecology (2016), Vol. 104, pp. 31-41	Relates to a long term monitoring study on earthworms specific to South America.
816	Ecotoxicology	Garza-Leon C. V. et al.	2017	Toxicity evaluation of cypermethrin, glyphosate, and malathion, on two indigenous zooplanktonic species.	Environmental science and pollution research international (2017), Vol. 24, No. 22, pp. 18123-18134	The tested formulation is not the representative formulation for the Annex I renewal.
817	Ecotoxicology	Gaupp-Berghausen M. et al.	2015	Glyphosate-based herbicides reduce the activity and reproduction of earthworms and lead to increased soil nutrient concentrations.	Scientific reports (2015), Vol. 5, pp. 12886	Paper discusses indirect impact of nutrient loads in soil after GBH application. Not relatable to EU ecotoxicology assessment.
818	Ecotoxicology	Ge HuiLin et al.	2014	Predicting joint toxicity of organophosphorus and triazine pesticides on green algae using the generalized concentration addition model.	China Environmental Science (2014), Vol. 34, No. 9, pp. 2413-2419	Discusses use of novel test approaches, not currently relevant to EU level risk assessment in ecotoxicology.

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819	Ecotoxicology	Georgieva E. et al.	2018	GLYPHOSATE-BASED HERBICIDE ALTERS THE HISTOLOGICAL STRUCTURE OF GILLS OF TWO ECONOMICALLY IMPORTANT CYPRINID SPECIES (COMMON CARP, CYPRINUS CARPIO AND BIGHEAD CARP, ARISTICHTHYS NOBILIS).	Applied Ecology and Environmental Research (2018), Vol. 16, No. 3, pp. 2295-2305	Observations in the paper cannot be related to the ANNEX I level EU risk assessment for renewal. Sub-lethal effects at the histopathological level are not considered in the EU level ecotoxicological risk assessment.
820	Ecotoxicology	Gertzog B. J. et al.	2011	Avoidance of three herbicide formulations by Eastern Red-backed Salamanders (Plethodon cinereus).	Herpetological Conservation and Biology (2011), Vol. 6, No. 2, pp. 237-241	Salamanders were exposed to glyphosate (and other pesticides) in a petri dish with avoidance measured. The endpoint is not relevant to the regulatory renewal of glyphosate.
821	Ecotoxicology	Geyer R. L. et al.	2016	Effects of Roundup formulations, nutrient addition, and Western mosquitofish (Gambusia affinis) on aquatic communities.	Environmental science and pollution research international (2016), Vol. 23, No. 12, pp. 11729-39	Formulations used do not match that of the representative formulation for the Annex I renewal. Effects from co-formulants cannot be excluded.
822	Ecotoxicology	Gherhardt T. et al.	2011	Avoidance behavior of Eisenia foetida to acetone, deltamethrin and glyphosate	Annals of West University of Timisoara, Series of Chemistry (2011), Vol. 20, No. 2, pp. 1-10	This study was a new design to look at the avoidance of earthworms to chemicals. The study was not conducted to a known guideline. For the glyphosate part of the study, all the worms died due to heat/dehydration and so the effects of glyphosate were not clearly determined and the endpoints are not relevant to the regulatory risk assessment of glyphosate.
823	Ecotoxicology	Gholami-Seyedkolaei S. J. et al.	2013	Effect of a glyphosate-based herbicide in Cyprinus carpio: assessment of acetylcholinesterase activity, hematological responses and serum biochemical parameters.	Ecotoxicology and environmental safety (2013), Vol. 98, pp. 135-41	Paper describes haematological and enzymatic biomarkers that could be used to assess the impact on fish in the field. There are no data presented that could be used in EU level Annex I renewal Ecotoxicological risk assessment.
824	Ecotoxicology	Gholami-Seyedkolaei S. J. et al.	2013	Optimization of recovery patterns in common carp exposed to roundup using response surface methodology: evaluation of neurotoxicity and genotoxicity effects and biochemical parameters.	Ecotoxicology and environmental safety (2013), Vol. 98, pp. 152-61	Molecular level results that are not relatable to an EU level ecotoxicology risk assessment.
825	Ecotoxicology	Ghose S. L. et al.	2014	Acute toxicity tests and meta-analysis identify gaps in tropical ecotoxicology for amphibians	Environmental Toxicology and Chemistry (2014), Vol. 33, No. 9, pp. 2114-2119	Paper does not present endpoint data on the representative formulation. Therefore not relevant.
826	Ecotoxicology	Giaquinto P. C. et al.	2017	Effects of Glyphosate-Based Herbicide Sub-Lethal Concentrations on Fish Feeding Behavior.	Bulletin of environmental contamination and toxicology (2017), Vol. 98, No. 4, pp. 460-464	Test design and endpoints are not used in EU level risk assessment for ANNEX I renewal.
827	Ecotoxicology	Givaudan N. et al.	2014	Earthworm tolerance to residual agricultural pesticide contamination: field and experimental assessment of detoxification capabilities.	Environmental pollution (2014), Vol. 192, pp. 9-18	Study provides information at the cellular/molecular level and is not an ecotoxicological relevant study

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828	Ecotoxicology	Gomes M. P. et al.	2017	Effects of glyphosate acid and the glyphosate-commercial formulation (Roundup) on Dimorphandra wilsonii seed germination: Interference of seed respiratory metabolism.	Environmental pollution (2017), Vol. 220, No. Pt A, pp. 452-459	Findings are not relatable to an EU level Annex I risk assessment as this species is only found in Brazil.
829	Ecotoxicology	Griesinger L. M. et al.	2011	Effects of a glyphosate-based herbicide on mate location in a wolf spider that inhabits agroecosystems.	Chemosphere (2011, Vol. 84, No. 10, pp. 1461-6	Study looks at the potential impact of glyphosate product on wolf spider mate location. Conducted in the US. No relevant endpoints generated for use in the risk assessment for the renewal of glyphosate.
830	Ecotoxicology	Grzesiuk A. et al.	2018	EFFECT OF ROOT-ZONE GLYPHOSATE EXPOSURE ON GROWTH AND ANTHOCYANINS CONTENT OF RADISH SEEDLINGS	ACTA SCIENTIARUM POLONORUM-HORTORUM CULTUS (2018), Vol. 17, No. 2, pp. 3-10	Unable to establish what exposure concentrations were used in the study. Therefore not relatable to an EU level risk assessment for EU renewal.
831	Ecotoxicology	Gueller P. et al.	2018	Investigation of some pesticides' effects on activities of glutathione reductase and glutathione S-transferase purified from turkey liver under in vitro conditions.	Journal of the Institute of Science and Technology (2018), Vol. 8, No. 3, pp. 211-217	Paper describes an in vitro enzyme assay that cannot be related to an EU level ecotoxicological risk assessment.
832	Ecotoxicology	Guijarro K. H. et al.	2018	Soil microbial communities and glyphosate decay in soils with different herbicide application history.	The Science of the total environment (2018), Vol. 634, pp. 974-982	Soil dissipation in Argentina is difficult to relate and thus not relevant to EU risk assessment.
833	Ecotoxicology	Guilherme S. et al.	2014	DNA and chromosomal damage induced in fish (Anguilla anguilla L.) by aminomethylphosphonic acid (AMPA)--the major environmental breakdown product of glyphosate.	Environmental science and pollution research international (2014), Vol. 21, No. 14, pp. 8730-9	The study assessed the impact of AMPA on Anguila anguila using COMET and ENA assays. The assays are not considered relevant to the ecotoxicological risk assessment for Annex I renewal. Therefore this paper should be considered non-relevant.
834	Ecotoxicology	Gutierrez M. F. et al.	2017	Disruption of the hatching dynamics of zooplankton egg banks due to glyphosate application.	Chemosphere (2017), Vol. 171, pp. 644-653	Endpoints based on abundance are used in EU level ecotoxicological risk assessment. The formulation used is not the representative formulation and therefore the impact of co-formulants cannot be excluded. Therefore this study is not relevant to the Annex I renewal.
835	Ecotoxicology	Hagner M. et al.	2019	Effects of a glyphosate-based herbicide on soil animal trophic groups and associated ecosystem functioning in a northern agricultural field	Scientific Reports (2019), Vol. 9, No. 1, pp. 1-13	This study looked at the effect of Roundup + hoeing on soil organisms. Effects on soil organisms based on Roundup alone cannot be determined from the presented data test groups. The test substance used is also based MON 78294 which is not the representative formulation for the Annex I renewal.
836	Ecotoxicology	Hanlon S. M. et al.	2012	The impact of pesticides on the pathogen Batrachochytrium dendrobatidis independent of potential hosts.	Archives of environmental contamination and toxicology (2012), Vol. 63, No. 1, pp. 137-43	Paper discusses the impact of various pesticides on fungal spores using approaches that generate endpoints not used in EU ecotoxicology risk assessment for Annex I renewal.
837	Ecotoxicology	Hanlon S. M. et al.	2014	The interactive effects of chytrid fungus, pesticides, and exposure timing on gray treefrog (Hyla versicolor) larvae.	Environmental toxicology and chemistry (2014), Vol. 33, No. 1, pp. 216-22	Contains POEA and thus not relevant to the EU level Annex I ecotoxicological risk assessment.

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838	Ecotoxicology	Hasan F. et al.	2016	Ecotoxicological hazards of herbicides on biological attributes of Zygogramma bicolorata Pallister (Coleoptera: Chrysomelidae).	Chemosphere (2016), Vol. 154, pp. 398-407	Novel surface residue exposure study that presents endpoint data that is not relatable to the EU level risk assessment.
839	Ecotoxicology	Hefnawy M. A. et al.	2012	Interaction of some herbicides with phosphate solublization by Aspergillus niger and Aspergillus fumigatus.	Australian Journal of Basic and Applied Sciences (2012), Vol. 6, No. 10, pp. 518-524	Findings are not directly related to the effects of glyphosate on the organism.
840	Ecotoxicology	Herbert L. T. et al.	2014	Effects of field-realistic doses of glyphosate on honeybee appetitive behaviour.	The Journal of experimental biology (2014), Vol. 217, No. Pt 19, pp. 3457-64	Endpoints described are not currently relevant to EU level ecotoxicology risk assessment.
841	Ecotoxicology	Hill M. P. et al.	2012	Toxic effect of herbicides used for water hyacinth control on two insects released for its biological control in South Africa	Biocontrol science and technology (2012), pp. 1321-1333	Non-EU monitoring study. Extrapolation to EU is difficult.
842	Ecotoxicology	Hirano L. Q. L. et al.	2019	Effects of egg exposure to atrazine and/or glyphosate on bone development in Podocnemis unifilis (Testudines, Podocnemididae).	Ecotoxicology and environmental safety (2019), Vol. 182, pp. 109400	Test approaches and observations performed are not relatable to EU level risk assessment.
843	Ecotoxicology	Hong Y. et al.	2018	Assessment of the oxidative and genotoxic effects of the glyphosate-based herbicide roundup on the freshwater shrimp, Macrobrachium nipponensis.	Chemosphere (2018), Vol. 210, pp. 896-906	Study conducted using a formulation of glyphosate that is not the representative formulation for the EU renewal.
844	Ecotoxicology	Houssou A. M. et al.	2017	Lethal and sub-lethal effects of cypermethrin and glyphosate on the freshwater's copepod, Acanthocyclops robustus.	ISJ-Invertebrate Survival Journal (2017), Vol. 14, pp. 140-148	The test species selected is also not described and environmental holding conditions (water quality) prior to and during the study were not indicated). The formulation (Kumark® (480 g/L) is not the representative formulation for the EU Annex I renewal (MON 52276). The study was not conducted to a guideline, but the acute toxicity test can be considered in-line with OECD guideline 202. According to OECD 202, the validity criteria are not met for Glyphosate (> 10 % mortality in the control). Additionally, there were no quantifiable endpoints presented in the paper to a non-standard species. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
845	Ecotoxicology	Hued A. C. et al.	2012	Exposure to a commercial glyphosate formulation (Roundup®) alters normal gill and liver histology and affects male sexual activity of Jenynsia multidentata (Anablepidae, Cyprinodontiformes).	Archives of environmental contamination and toxicology (2012), Vol. 62, No. 1, pp. 107-17	Not the representative formulation. The formulation Roundup Max is based on MON 14420, which is not MON 52276, the representative formulation used in the renewal process.

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846	Ecotoxicology	Iannilli V. et al.	2019	Genotoxic effects induced by glyphosate-based herbicide on two gammarid species: the invasive Dikerogammarus villosus (Sowinsky, 1894) (Crustacea, Amphipoda) and the native Echinogammarus veneris (Heller, 1865).	Fundamental and Applied Limnology (2019), Vol. 193, No. 2, pp. 143-153	Endpoints cannot be used in an EU ecotoxicological risk assessment for Annex I renewal.
847	Ecotoxicology	Imre P. et al.	2018	TOXICITY TEST OF INDIVIDUAL AND COMBINED TOXIC EFFECTS OF HERBICIDE AMEGA AND COPPER-SULPHATE ON PHEASANT EMBRYOS. Original Title: AMEGA GYOMIRTO SZER ES A REZ-SZULFAT EGYEDI ES EGYUTTES MEREGHATASANAK VIZSGALATA FACANEMBRIOKBAN.	Novenyvdelem (2018), Vol. 54, No. 11, pp. 476-482	It is not possible to relate the observed effects in the study to the ecotoxicology risk assessment for EU renewal.
848	Ecotoxicology	Iori S. et al.	2019	The effects of glyphosate and AMPA on the mediterranean mussel Mytilus galloprovincialis and its microbiota.	Environmental research (2019), Vol. 182, pp. 108984	Paper discusses the effects of glyphosate at the molecular level which not used in an EU level assessment or renewal.
849	Ecotoxicology	Iummato M. M. et al.	2013	Evaluation of biochemical markers in the golden mussel Limnoperna fortunei exposed to glyphosate acid in outdoor microcosms.	Ecotoxicology and environmental safety (2013), Vol. 95, pp. 123-9	Cellular level endpoints cannot be related to the Ecotoxicology Annex I renewal risk assessment.
850	Ecotoxicology	Janben R. et al.	2019	A Glyphosate Pulse to Brackish Long-Term Microcosms Has a Greater Impact on the Microbial Diversity and Abundance of Planktonic Than of Biofilm Assemblages	FRONTIERS IN MARINE SCIENCE (2019), Vol. 6, Article 758	Paper discusses a novel technique to monitor the effects of herbicide on brackish proteo bacteria and bacterial communities measuring 16S rRNA genes in samples of water accompanied by total cell counts and using operational taxonomic units. Whilst informative techniques were used, these data are not relevant to an EU level Annex I ecotoxicological risk assessment according to the 1107/2009 data requirements.
851	Ecotoxicology	Janssens L. et al.	2017	Stronger effects of Roundup than its active ingredient glyphosate in damselfly larvae.	Aquatic toxicology (2017), Vol. 193, pp. 210-216	Formulation tested contains POEA which is not present in the representative product in the EU renewal.
852	Ecotoxicology	Jantawongsri K. et al.	2015	Altered immune response of the rice frog Fejervarya limnocharis living in agricultural area with intensive herbicide utilization at Nan Province, Thailand.	Environment Asia (2015), Vol. 8, No. 1, pp. 68-74	Paper presents results of liver analyses from field collected frogs, in sites in Thailand where multiple pesticides have been used. Glyphosate was one of the chemicals used in the rice growing area, but no specific data relating to glyphosate that could be used in an EU level risk assessment is presented.
853	Ecotoxicology	Jaskulski D. et al.	2011	Effect of pre-harvest glyphosate application on grain germination and emergence of winter wheat self-sown plants. Wpyw glifosatu stosowanego przed zbiorem na kiekowanie ziarna i wschody samosiewow pszenicy ozimej.	Progress in Plant Protection (2011), Vol. 51, No. 2, pp. 927-931	Roundup energy (450 SL) is the test substance in this study which is not the representative product for the renewal of glyphosate. The study is conducted in winter wheat, this is not a use on the representative GAP table for the renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
854	Ecotoxicology	Jayawardena U. A. et al.	2011	Acute and chronic toxicity of four commonly used agricultural pesticides on the Asian common toad, Bufo melanostictus schneider	Journal of the National Science Foundation of Sri Lanka (2011), Vol. 39, No. 3, pp. 267-276	Study was conducted with glyphosate product in Sri Lanka, determining the toxicity to the Asian common toad. Egg strands collected from a university park in Sri Lanka, whereupon the tadpoles were subsequently exposed up to 25 ppm glyphosate.tTest concentrations wererenewed weekly, with observations at 10 and 30 days on metamorphosis. 48hr LC50 values were determined for glyphosate. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
855	Ecotoxicology	Jayawardena U. A. et al.	2010	Toxicity of agrochemicals to common hourglass tree frog (Polypedates cruciger) in acute and chronic exposure.	International Journal of Agriculture and Biology (2010), Vol. 12, No. 5, pp. 641-648	Conducted with glyphosate product in Sri Lanka, studies looks at the toxicity to the Common hourglass tree frog. Egg masses were collected from a university park in Sri Lanka, with tadpoles then exposed up to 1 ppm for a chronic test. Test concentrations were renewed weekly, observations made on metamorphosis. The material and methods lacks important information. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
856	Ecotoxicology	Jayawardena U. A. et al.	2017	Effects of agrochemicals on disease severity of Acanthostomum burminis infections (Digenea: Trematoda) in the Asian common toad, Duttaphrynus melanostictus.	BMC Zoology (2017), Vol. 2, No. 13, pp. 1	Discusses results of exposure of nematode disease rates to multiple a.i. including a glyphosate formulation containing POEA. POEA containing formulations are not relevant to EU level risk assessment.
857	Ecotoxicology	Jenkins M. B. et al.	2017	Impact of glyphosate-resistant corn, glyphosate applications and tillage on soil nutrient ratios, exoenzyme activities and nutrient acquisition ratios.	Pest management science (2017), Vol. 73, No. 1, pp. 78-86	Long term monitoring study that is not relevant for ecotoxicological risk assessment for Annex I glyphosate renewal.
858	Ecotoxicology	Jesenska S. et al.	2011	Species Sensitivity Distribution (SSD) - application in environmental risk assessment of pesticides in European rivers. Distribuce citlivosti druhu (Species Sensitivity Distribution - SSD) - vyuziti pro hodnoceni rizik pesticidu v evropskych rekach.	Bulletin - VURH Vodnany (2011), Vol. 47, No. 3, pp. 29-38	Data for glyphosate was used in a SSD model to look at the river ecosystem (in Belgium). Concentrations were monitored at locations with the river basin and used in the model. Results were not relevant for the risk assessment.
859	Ecotoxicology	Jiang J. et al.	2017	Influence of commonly used pesticides on acute toxicity to earthworm Eisenia fetida and alteration of antioxidant enzyme activities.	Journal of Agro-Environment Science (2017), Vol. 36, No. 3, pp. 466-473	Acute toxicity to earthworms is not a data requirement in the EU level Annex I ecotoxicology risk assessment.
860	Ecotoxicology	Jin J. et al.	2018	Sub-lethal effects of herbicides penoxsulam, imazamox, fluridone and glyphosate on Delta Smelt (Hypomesus transpacificus).	Aquatic toxicology (2018), Vol. 197, pp. 79-88	Presented endpoints based on cellular levels of enzymes cannot be related to an Ecotoxicological risk assessment for Annex I renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
861	Ecotoxicology	Jofre D. M. et al.	2015	Acute and chronic toxicity of glyphosate to native fish from San Luis province, Argentina	Current Topics In Toxicology (2015), Vol. 11, pp. 49-54	The tested formulation contains POEA and is therefore not relevant to the MON 52276 representative formulation for the Annex I renewal.
862	Ecotoxicology	Jones D. K. et al.	2010	Roundup and amphibians: the importance of concentration, application time, and stratification.	Environmental toxicology and chemistry (2010), Vol. 29, No. 9, pp. 2016-25	Glyphosate product tests performed with larval amphibians (wood frog and American toads) in an outdoor mesocosms in the US. Up to 3 mg ae/L was applied at 0, 7 and 14 days to the mesocosm, and replicated. Egg masses were collected from nearby ponds and hatched in culture ponds with aged well-water. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
863	Ecotoxicology	Jones D. K. et al.	2010	Competitive stress can make the herbicide Roundup more deadly to larval amphibians	Environmental Toxicology and Chemistry (2010), Vol. 30, No. 2, pp. 446-454	This study assessed competition as a stressor in conjunction with Roundup treatment in an outdoor mesocosm (USA) containing different densities of tadpoles (green frogs, gray tree frogs, american bullfrogs). Glyphosate product was applied up to 3 mg ae/L for 7 dayswith replication. Egg masses were collected from nearby ponds and hatched in wading pools with aged well-water. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
864	Ecotoxicology	Kalai K. et al.	2018	Haemato-biochemical alterations in induced acute glyphosate ($C3H8NO5P$) intoxication in Kuroiler birds	International Journal of Chemical Studies (2018), Vol. 6, No. 4, pp. 1-4	Paper contains data that cannot be related to an EU level ecotoxicology risk assessment.
865	Ecotoxicology	Karahan A. et al.	2018	Determination of the effect of some pesticides on honey bees.	International Journal of Agriculture, Environment and Food Sciences (2018), Vol. 2, No. 3, pp. 104-108	No effects observed from glyphosate exposure on body movement, however, endpoint not relevant for an EU level Annex I ecotoxicology risk assessment.
866	Ecotoxicology	Kelly D. W. et al.	2010	Synergistic effects of glyphosate formulation and parasite infection on fish malformations and survival	Journal of applied ecology (2010), Vol. 47, No. 2, pp. 498-504	Snails collected from a river in New Zealand. Study looks at exposure to glyphosate + POEA surfactant (diluted to 0.36 mg a.i./L), and parasite infection with particular emphasis on spinal malformation and survival of juvenile fish.The study also looks at the influence of glyphosate concentration on the rate of infection and survival of P.antipodarum snails. The paper does not contribute to the renewal of glyphosate in the EU.
867	Ecotoxicology	Khan A. et al.	2016	Comparative Study of Toxicological Impinge of Glyphosate And Atrazine (Herbicide) on Stress Biomarkers; Blood Biochemical and Haematological Parameters of the Freshwater Common Carp (Cyprinus carpio).	Polish Journal of Environmental Studies (2016), Vol. 25, No. 5, pp. 1995-2001	Molecular and chemical observations are not relevant to traditional ecotoxicological risk assessment. Population level effects may not be inferred from such observations.
868	Ecotoxicology	Kielak E. et al.	2011	Phytotoxicity of Roundup Ultra 360 SL in aquatic ecosystems: Biochemical evaluation with duckweed (Lemna minor L.) as a model plant	Pesticide biochemistry and physiology (2011), Vol. 99, No. 3, pp. 237-243	Use of glyphosate product in a study on lemna to assess the impact on biomass and Chlorophyll content of plants. This study was performed in Poland. The paper does not contribute to the renewal of glyphosate in the EU.

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869	Ecotoxicology	King J. J. et al.	2010	Toxic Effects of the Herbicide Roundup Regular on Pacific Northwestern Amphibians	Northwestern Naturalist (2010), Vol. 91, no. 3, pp. 318-324	Conducted in the US. Glyphosate product + POEA surfactant, used in a study to look at the effect on amphibians (collected from the wild, kept in aerated pond water until 24 hr after hatching), up to 5 mg/L, static tests, pH buffered with spring water, LC50 generated. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
870	Ecotoxicology	Kittle R. P. et al.	2018	Effects of glyphosate herbicide on the gastrointestinal microflora of Hawaiian green turtles (Chelonia mydas) Linnaeus.	Marine pollution bulletin (2018), Vol. 127, pp. 170-174	Discusses a novel technique using isolated strains of bacteria from turtle guts to assess their sensitivity to glyphosate. Findings not relatable to an EU level ecotoxicology risk assessment for Annex I renewal.
871	Ecotoxicology	Koakoski G. et al.	2014	Agrichemicals chronically inhibit the cortisol response to stress in fish.	Chemosphere (2014), Vol. 112, pp. 85-91	End-points based on measured stress hormones are not relevant to an EU level Annex I ecotoxicology risk assessment for renewal.
872	Ecotoxicology	Kondera E. et al.	2018	Effect of glyphosate-based herbicide on hematological and hemopoietic parameters in common carp (Cyprinus carpio L).	Fish physiology and biochemistry (2018), Vol. 44, No. 3, pp. 1011-1018	End-points presented are not relevant to an EU level risk assessment for glyphosate renewal in the EU.
873	Ecotoxicology	Koprivnikar J. et al.	2012	Agricultural effects on amphibian parasitism: importance of general habitat perturbations and parasite life cycles.	Journal of wildlife diseases (2012), Vol. 48, No. 4, pp. 925-36	Pond sampling / monitoring study performed in Canada. Not relatable to an EU level ecotoxicology risk assessment for Annex I renewal.
874	Ecotoxicology	Kostopoulou S. et al.	2020	Assessment of the effects of metribuzin, glyphosate, and their mixtures on the metabolism of the model plant Lemna minor L. applying metabolomics.	Chemosphere (2020), Vol. 239, pp. 124582	The paper describes a metabolomics approach to establish the impact of glyphosate alone and mixtures with metribuzin on the metabolome of lemna. Novel approach to biomarker detection is not considered in an EU level assessment.
875	Ecotoxicology	Krynak K. L. et al.	2017	Rodeo (TM) Herbicide Negatively Affects Blanchard's Cricket Frogs (Acris blanchardi) Survival and Alters the Skin-Associated Bacterial Community.	Journal of Herpetology (2017), Vol. 51, No. 3, pp. 402-410	Uses a formulation that is not relevant to the EU renewal of Glyphosate. (RODEO)
876	Ecotoxicology	Lacaze E. et al.	2010	Genotoxicity assessment in the amphipod Gammarus fossarum by use of the alkaline Comet assay	Mutation Research, Genetic Toxicology and Environmental Mutagenesis (2010), Vol. 700, No. 1-2, pp. 32-38	This study is the development of an assay. Endpoints cannot be used in the regulatory risk assessment of glyphosate.
877	Ecotoxicology	Lajmanovich R. C. et al.	2011	Toxicity of four herbicide formulations with glyphosate on Rhinella arenarum (anura: bufonidae) tadpoles: B-esterases and glutathione S-transferase inhibitors.	Archives of environmental contamination and toxicology (2011), Vol. 60, No. 4, pp. 681-9	Compared toxicity to tadpoles exposed to a range of glyphosate products up to 240 mg ae/L for 48 hrs, enzyme activity was measured. Tadpoles collected from the wild (non-agricultural areas in Argentina, acclimated for 48 hrs). LC50 generated withvery high concentrations tested.
878	Ecotoxicology	Lajmanovich R. C. et al.	2013	Individual and Mixture Toxicity of Commercial Formulations Containing Glyphosate, Metsulfuron-Methyl, Bispyribac-Sodium, and Picloram on Rhinella arenarum Tadpoles.	Water Air and Soil Pollution (2013), Vol. 224, No. 3, pp. Article No.: 1404	Formulation used in the testing is not the representative formulation for the Annex 1 renewal. Also difficult to relate the cellular and molecular level endpoints to an Annex I ecotoxicology risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
879	Ecotoxicology	Lallana M. d. C. et al.	2013	Determination of root length reduction (EC50) by a glyphosate formulation using lettuce and wheat as biological indicator species. Original Title: Determinacion de reduccion del crecimiento radical (CE50) por una formulacion de glifosato utilizando lechug	Revista de la Facultad de Ciencias Agrarias Universidad Nacional de Cuyo (2013), Vol. 45, No. 1, pp. 143-151	Endpoints presented were not generated using a test design that reflects use in the field and as such is not considered relevant / relatable to an EU level risk assessment for PPP Annex I renewal.
880	Ecotoxicology	Lance E. et al.	2016	Accumulation and detoxication responses of the gastropod Lymnaea stagnalis to single and combined exposures to natural (cyanobacteria) and anthropogenic (the herbicide RoundUp(®) Flash) stressors.	Aquatic toxicology (2016), Vol. 177, pp. 116-24	Molecular level results that are not relatable to an EU level ecotoxicology risk assessment.
881	Ecotoxicology	Lanctot C. et al.	2013	Effects of the glyphosate-based herbicide Roundup WeatherMax® on metamorphosis of wood frogs (Lithobates sylvaticus) in natural wetlands.	Aquatic toxicology (2013), Vol. 140-141, pp. 48-57	Roundup WeatherMAX contains surfactants that are not relevant to the EU level renewal of glyphosate onto Annex I.
882	Ecotoxicology	Lanctot C. et al.	2014	Effects of glyphosate-based herbicides on survival, development, growth and sex ratios of wood frog (Lithobates sylvaticus) tadpoles. II: agriculturally relevant exposures to Roundup WeatherMax® and Vision® under laboratory conditions.	Aquatic toxicology (2014), Vol. 154, pp. 291-303	The tested formulation contains POEA and is therefore not relevant to the MON 52276 representative formulation for the Annex I renewal.
883	Ecotoxicology	Lanzarin G. A. B. et al.	2019	Dose-dependent effects of a glyphosate commercial formulation - Roundup(®) UltraMax - on the early zebrafish embryogenesis.	Chemosphere (2019), Vol. 223, pp. 514-522	Paper concerns a Roundup formulation that is not the representative formulation for the Annex I renewal.
884	Ecotoxicology	Latorre M. A. et al.	2013	Effects of in vivo exposure to Roundup® on immune system of Caiman latirostris.	Journal of immunotoxicology (2013), Vol. 10, No. 4, pp. 349-54	This study provided blood chemistry analysis for Caiman exposed to Roundup for long periods. These data are not considered to be relevant to the EU level ecotoxicology risk assessment for Annex I renewal. Roundup used also contains POEA, which is a surfactant system not present in the representative formulation.
885	Ecotoxicology	Levis N. A. et al.	2015	Level of UV-B radiation influences the effects of glyphosate-based herbicide on the spotted salamander.	Ecotoxicology (2015), Vol. 24, No. 5, pp. 1073-86	Study investigates the effect on different UV light regimes on the effects on glyphosate on salamanders. As no specific effects and concentrations related to glyphosate alone are not mentioned, the findings are not relevant to an EU level renewal assessment for annex I.
886	Ecotoxicology	Levis N. A. et al.	2016	Non-adaptive phenotypic plasticity: the effects of terrestrial and aquatic herbicides on larval salamander morphology and swim speed	Biological journal of the Linnean Society (2016), Vol. 118, No. 3, pp. 569-581	Adaptive phenotypic plasticity is not an endpoint / observed parameter considered in the EU level ecotoxicology risk assessment for Annex I renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
887	Ecotoxicology	Li M. et al.	2017	Metabolic profiling of goldfish (Carassius auratis) after long-term glyphosate-based herbicide exposure.	Aquatic toxicology (2017), Vol. 188, pp. 159-169	Metabolomic approaches to assessing the fate of pesticides in organisms looks specifically at cellular and molecular level based endpoints that are not used in the EU level ecotoxicology risk assessment for Annex I renewal.
888	Ecotoxicology	Li P-L. et al.	2015	Response of Nitzschia amplectens in growth and kinestate to glyphosate original powder	Nongyao (2015), Vol. 54, No. 2, pp. 108-111	Based on Roundup Original which contains POEA which is not relevant at EU level for MON 52276 renewal. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the renewal.
889	Ecotoxicology	Li Q. et al.	2013	Effects of herbicides application on allelopathic potential of Eupatorium catarium.	Allelopathy Journal (2013), Vol. 31, No. 1, pp. 139-146	Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity).
890	Ecotoxicology	Li Y. et al.	2019	Acute exposure of glyphosate-based herbicide induced damages on common carp organs via heat shock proteins-related immune response and oxidative stress	Toxin Reviews (2019), Ahead of Print, https://doi.org/10.1080/15569543.2019.1621903	Formulation is not the representative formulation for the ANNEX I renewal of glyphosate. As the identity of the powder and the form in which it was supplied (salt type, to establish acid equivalence content) cannot be confirmed. Co-formulants are also unknown.
891	Ecotoxicology	Lipok J. et al.	2010	The toxicity of Roundup® 360 SL formulation and its main constituents: glyphosate and isopropylamine towards non-target water photoautotrophs.	Ecotoxicology and environmental safety (2010), Vol. 73, No. 7, pp. 1681-8	Uses glyphopsate product, study looking at impact on marine microbial (algae) communities (14 d old log-phase cultures used), exposed up to 3mM of GLY. EC50 generated. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
892	Ecotoxicology	Liu C. et al.	2012	Size-controlled preparation of hollow silica spheres and glyphosate release	Transactions of Nonferrous Metals Society of China (2012), Vol. 22, No. 5, pp. 1161-1168	This paper relates to the development of a silica capsule. Glyphosate is mentioned as the example chemical that demonstrates increased release rate with thinning of the capsule wall. Not relevant for 2022 ecotox renewal risk assessment.
893	Ecotoxicology	Lo C-C.	2010	Effect of pesticides on soil microbial community.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2010), Vol. 45, No. 5, pp. 348-59	Conducted in China. Review of toxicity studies to look at the effect of glyphosate and other chemistry to soil microflora. As it's a review of other data it doesn't bring any specific endpoint to the Regulatory risk assessment of glyphosate renewal.
894	Ecotoxicology	Lopes da Silva E. T. et al.	2016	LETHAL CONCENTRATION OF GLYPHOSATE FOR JUVENILES OF CURIMATA-PACU. Original Title: CONCENTRACAO LETAL DO GLIFOSATO PARA JUVENIS DE CURIMATA-PACU.	Boletim Do Instituto De Pesca (2016), Vol. 42, No. 4, pp. 759-764	Concerns a formulation of Glyphosate (ATANOR®) that is not the representative formulation for the Annex I renewal.
895	Ecotoxicology	Lopes F. M. et al.	2018	Toxicity induced by glyphosate and glyphosate-based herbicides in the zebrafish hepatocyte cell line (ZF-L).	Ecotoxicology and environmental safety (2018), Vol. 162, pp. 201-207	The formulated product used in the test contains MON 2139 which contains POEA (MON0818). Therefore findings are not relevant to the EU level renewal as are not representative formulation for the Annex I renewal.
896	Ecotoxicology	Lopes F. M. et al.	2017	Glyphosate Adversely Affects Danio rerio Males: Acetylcholinesterase Modulation and Oxidative Stress.	Zebrafish (2017), Vol. 14, No. 2, pp. 97-105	Endpoints not relatable to an EU level ecotoxicology risk assessment for Annex I renewal.
897	Ecotoxicology	Lopes F. M. et al.	2014	Effect of glyphosate on the sperm quality of zebrafish Danio rerio.	Aquatic toxicology (2014), Vol. 155, pp. 322-6	Endpoint not used in EU level ecotoxicology risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
898	Ecotoxicology	Louch J. et al.	2017	Potential risks to freshwater aquatic organisms following a silvicultural application of herbicides in Oregon's Coast Range.	Integrated environmental assessment and management (2017), Vol. 13, No. 2, pp. 396-409	This is a specific non-EU monitoring study that cannot be related to an EU level ecotoxicology risk assessment for Annex I renewal.
899	Ecotoxicology	Lozano V. L. et al.	2018	Effects of glyphosate and 2,4-D mixture on freshwater phytoplankton and periphyton communities: a microcosms approach	Ecotoxicology and Environmental Safety (2018), Vol. 148, pp. 1010-1019	The focus of the study was on phytoplankton and periphyton communities. However, no information on the source and history of the phytoplankton and periphyton communities are given. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment. (The glyphosate formulation Glifosato Atanor® was used in the microcosm study). In addition, no regulatory useful endpoint was derived.
900	Ecotoxicology	Lyons M. et al.	2018	Effects of 4-nonylphenol and formulations of five pesticides: cypermethrin, deltamethrin, glyphosate, imidacloprid and mancozeb on growth of Atlantic salmon (Salmo salar L.) during parr-smolt transformation.	Canadian Technical Report of Fisheries and Aquatic Sciences (2018), Vol. 3265, pp. 1-42	Fish exposed to a glyphosate formulation that is not the representative formulation for the Annex I renewal.
901	Ecotoxicology	Ma J. et al.	2015	Alteration in the cytokine levels and histopathological damage in common carp induced by glyphosate.	Chemosphere (2015), Vol. 128, pp. 293-8	Endpoints not relatable to an EU level risk assessment for Annex I renewal.
902	Ecotoxicology	Ma J. et al.	2015	Immunological and histopathological responses of the kidney of common carp (Cyprinus carpio L.) sublethally exposed to glyphosate.	Environmental toxicology and pharmacology (2015), Vol. 39, No. 1, pp. 1-8	Molecular level results that are not relatable to an EU level ecotoxicology risk assessment.
903	Ecotoxicology	Ma J. et al.	2019	Biochemical and molecular impacts of glyphosate-based herbicide on the gills of common carp.	Environmental pollution (2019), Vol. 252, No. Pt B, pp. 1288-1300	Paper discusses biochemical and molecular impacts that are not relatable to an EU level RA for Annex I renewal
904	Ecotoxicology	Magano D. A. et al.	2013	Side-effects of herbicides applied in soybean Trichogramma pretiosum. Efeitos secundarios de herbicidas aplicados em soja sobre Trichogramma pretiosum.	Pesquisa Agropecuaria Gaucha (2013), Vol. 19, No. 1/2, pp. 69-80	The formulations used that contain glyphosate were Glyphosate Atanor and Roundup Original. The Roundup formulation contains POEA and is therefore not relevant for the EU. Concerning ATANOR, this is not the representative formulation and it is difficult to relate the observed effects with the ecotoxicology risk assessment for EU Annex I renewal of MON 52276.
905	Ecotoxicology	Magbanua F. S. et al.	2013	Understanding the combined influence of fine sediment and glyphosate herbicide on stream periphyton communities.	Water research (2013), Vol. 47, No. 14, pp. 5110-20	This study investigated the combination of sediment and glyphosate effects on an mesocosm community. Results not relatable to an EU level ecotoxicological risk assessment.
906	Ecotoxicology	Magbanua F. S. et al.	2013	Individual and combined effects of fine sediment and the herbicide glyphosate on benthic macroinvertebrates and stream ecosystem function	Freshwater biology (2013), Vol. 58, No. 8, pp. 1729-1744	Paper describes a specific multiple mesocosm study conducted in New Zealand using an undefined source of glyphosate.

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907	Ecotoxicology	Malecot M. et al.	2013	Specific proteomic response of Unio pictorum mussel to a mixture of glyphosate and microcystin-LR.	Journal of proteome research (2013), Vol. 12, No. 11, pp. 5281-92	Observed findings are not relatable to an EU level ecotoxicological risk assessment for Annex I purposes.
908	Ecotoxicology	Mandl K. et al.	2018	Effects of Glyphosate-, Glufosinate- and Flazasulfuron-Based Herbicides on Soil Microorganisms in a Vineyard.	Bulletin of environmental contamination and toxicology (2018), Vol. 101, No. 5, pp. 562-569	The product used was Roundup Powerflex, which is based on MON 79351 that contains 47.6% acid equivalence, and not MON 52276. Endpoints based on bacterial CFUs are difficult to relate to an ecotoxicological Annex I risk assessment. The work was also conducted in a vineyard that had a history of other pesticides being used. As identified by the Author, this cannot be excluded as having influenced the findings.
909	Ecotoxicology	Alvarez M. et al.	2012	Toxicity in fishes of herbicides formulated with glyphosate	Acta Toxicologica Argentina (2012), Vol. 20, No. 1, pp. 5-13	Two formulations and a test solution prepared using technical material were used. The two formulations were glacoxan and Roundup. The Roundup contains POEA and therefore is not relevant to the EU. The Glacoxan is a home and garden use formulation that is not related to the representative formulation. It is therefore not relevant to an EU level risk assessment for the Annex I renewal.
910	Ecotoxicology	Maria M. A. et al.	2018	Evaluation of glyphosate effect concentration to control Eichhornia crassipes and Salvinia sp. Avaliacao da concentracao de efeito do glifosato para controle de Eichhornia crassipes e Salvinia sp.	Engenharia Sanitaria e Ambiental (2018), Vol. 23, No. 5, pp. 881-889	On translated paper review, it is apparent that the study was conducted with a formulation (Roundup Original) that contains POEA - uncertain if observed effects were due to product or down to the action of POEA. POEA is not in the Annex I representative formulation and therefore these findings are not relevant to the ecotoxicology risk assessment for renewal.
911	Ecotoxicology	Martin L. J. et al.	2013	A preliminary assessment of the response of a native reptile assemblage to spot-spraying invasive Bitou Bush with glyphosate herbicide.	Ecological Management & Restoration (2013), Vol. 14, No. 1, pp. 59-62	NON-EU long term monitoring site, therefore non-relatable to EU level ANNEX I renewal.
912	Ecotoxicology	Marusca T.	2017	Oversowing or resowing of subalpine grassland appointed after the dynamics of floristic composition.	Romanian Journal of Grassland and Forage Crops (2017), No. 15, pp. 45-55	Study describes ecological succession and not specific effects of glyphosate on NTOs, therefore not relevant to EU level Annex I ecotoxicology risk assessment.
913	Ecotoxicology	Mateos-Naranjo E. et al.	2013	Effects of sub-lethal glyphosate concentrations on growth and photosynthetic performance of non-target species Bolboschoenus maritimus.	Chemosphere (2013), Vol. 93, No. 10, pp. 2631-8	End-points not considered relevant to an EU level risk assessment (ecotoxicology) for Annex I renewal.
914	Ecotoxicology	Matozzo V. et al.	2018	Ecotoxicological risk assessment for the herbicide glyphosate to non-target aquatic species: A case study with the mussel Mytilus galloprovincialis.	Environmental pollution (2018), Vol. 233, pp. 623-632	No control data are presented. The concept of up and down-regulation of genes following exposure to glyphosate within the context of a risk assessment is not relatable to the EU renewal. The purity of the test substance is not presented so dosing cannot be confirmed. The environmental conditions of the exposure phase are not presented other than salinity and temperature. No positive control included.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
915	Ecotoxicology	Matozzo V. et al.	2018	Effects of aminomethylphosphonic acid, the main breakdown product of glyphosate, on cellular and biochemical parameters of the mussel Mytilus galloprovincialis	Fish & shellfish immunology (2018), Vol. 83, pp. 321-329	Cellular level parameters discussed in paper, with endpoints that are not relevant to an Annex I renewal from ecotoxicology perspective.
916	Ecotoxicology	Matozzo V. et al.	2019	Glyphosate affects haemocyte parameters in the clam Ruditapes philippinarum.	Marine environmental research (2019), Vol. 146, pp. 66-70	Paper contains data that cannot be related to an EU level ecotoxicology risk assessment.
917	Ecotoxicology	Matozzo V. et al.	2019	Ecotoxicological hazard of a mixture of glyphosate and aminomethylphosphonic acid to the mussel Mytilus galloprovincialis (Lamarck 1819).	Scientific reports (2019), Vol. 9, No. 1, pp. 14302	End-points based on enzyme levels cannot be related to the EU level Annex I risk assessment.
918	Ecotoxicology	Matozzo V. et al.	2018	Ecotoxicological risk assessment for the herbicide glyphosate to non-target aquatic species: A case study with the mussel Mytilus galloprovincialis	Environmental pollution (2018), Vol. 233, pp. 623-632	Molecular level results that are not relatable to an EU level ecotoxicology risk assessment.
919	Ecotoxicology	McNally S. R. et al.	2017	Herbicide application during pasture renewal initially increases root turnover and carbon input to soil in perennial ryegrass and white clover pasture	Plant and soil (2017), Vol. 412, No. 1-2, pp. 133-142	Looks at root turnover as a means of sequestering carbon into soils. No specific endpoints useable in ecotoxicology EU level risk assessment for EU Annex I renewal.
920	Ecotoxicology	McVey K. A. et al.	2016	Exposure of C. elegans eggs to a glyphosate-containing herbicide leads to abnormal neuronal morphology.	Neurotoxicology and teratology (2016), Vol. 55, pp. 23-31	The article does not report results, which can be used for risk assessment and information is insufficient to transfer values into such determinants.
921	Ecotoxicology	Medeiros E. V. d. et al.	2014	Impact of glyphosate on microbial attributes of soil planted with two species of passion fruit.	Revista Caatinga (2014), Vol. 27, No. 1, pp. 1-8	Non-EU soil based comparative experiment to establish the impact of glyphosate on bacterial populations in soil for two different species of passion fruit in Brazil. The test design was described without specific detail on the amount of glyphosate being applied so any impacts could not be related to exposure. Therefore findings cannot be related to an EU level risk assessment for Annex I renewal.
922	Ecotoxicology	Mekhed O. B. et al.	2013	Impact of Water Pollution by Herbicides Zenkor and Roundup on Metabolism in Liver of Fishes of the Fam. Cyprinidae.	Hydrobiological Journal (2013), Vol. 49, No. 5, pp. 74-80	Molecular level results that are not relatable to an EU level ecotoxicology risk assessment.
923	Ecotoxicology	Menendez-Helman R. J. et al.	2015	Subcellular energy balance of Odontesthes bonariensis exposed to a glyphosate-based herbicide.	Ecotoxicology and environmental safety (2015), Vol. 114, pp. 157-63	Molecular level results that are not relatable to an EU level ecotoxicology risk assessment.
924	Ecotoxicology	Menezes C. W. G. et al.	2012	Reproductive and toxicological impacts of herbicides used in Eucalyptus culture in Brazil on the parasitoid Palmistichus elaeisis (Hymenoptera: Eulophidae)	Weed research (2012), Vol. 52, No. 6, pp. 520-525	Article not investigating properties of the active substance glyphosate. The articles does not cover any data requirement under EC Regulation 1107/2009.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
925	Ecotoxicology	Mensah P. et al.	2012	Using growth measures in the freshwater shrimp Caridina nilotica as biomarkers of Roundup registered pollution of South African freshwater systems	Physics and Chemistry of the Earth, Parts A/B/C (2012), Vol. 50, pp. 262-268	The formulation is based on MON 2139, which contains MON 0818 (that includes POEA) which is not relevant for the EU representative formulation. The confounding effects of POEA on the results cannot be excluded as no glyphosate technical grade only treatments were included, therefore findings are considered relevant to EU level ecotoxicology risk assessment for Annex I renewal.
926	Ecotoxicology	Mensah P. K. et al.	2012	Acetylcholinesterase activity in the freshwater shrimp Caridina nilotica as a biomarker of Roundup (R) herbicide pollution of freshwater systems in South Africa.	Water Science and Technology (2012), Vol. 66, No. 2, pp. 402-408	Formulation used in the study contains POEA that is not relevant to the EU renewal.
927	Ecotoxicology	Meshkini S. et al.	2019	The acute and chronic effect of Roundup herbicide on histopathology and enzymatic antioxidant system of Oncorhynchus mykiss.	International Journal of Environmental Science and Technology (2019), Vol. 16, No. 11, pp. 6847-6856	Roundup was used which contains POEA. This is not the representative formulation for the Annex I renewal.
928	Ecotoxicology	Mestre A. P. et al.	2019	Effects of cypermethrin (pyrethroid), glyphosate and chlorpyrifos (organophosphorus) on the endocrine and immune system of Salvator merianae (Argentine tegu).	Ecotoxicology and environmental safety (2019), Vol. 169, pp. 61-67	Formulation of glyphosate considered in the paper is not the representative formulation being considered for the Annex I renewal in EU.
929	Ecotoxicology	Meza-Joya F. L. et al.	2013	Toxic, cytotoxic, and genotoxic effects of a glyphosate formulation (Roundup®SL-Cosmoflux®411F) in the direct-developing frog Eleutherodactylus johnstonei.	Environmental and molecular mutagenesis (2013), Vol. 54, No. 5, pp. 362-73	Study is conducted on a formulation of glyphosate that is not the representative formulation in the EU.
930	Ecotoxicology	Miko Z. et al.	2017	Effects of a glyphosate-based herbicide and predation threat on the behaviour of agile frog tadpoles.	Ecotoxicology and environmental safety (2017), Vol. 140, pp. 96-102	The results of the study are not based on direct toxic effects of glyphosate to tadpoles, but are based on the interactive effects in the presence of predators. Endpoints of this type are not used in EU level risk assessment for Annex I renewal purposes.
931	Ecotoxicology	Miko Z. et al.	2017	Standardize or Diversify Experimental Conditions in Ecotoxicology? A Case Study on Herbicide Toxicity to Larvae of Two Anuran Amphibians.	Archives of environmental contamination and toxicology (2017), Vol. 73, No. 4, pp. 562-569	Formulation Glyphogan Classic used in the study contains POEA which is not relevant to an EU level risk assessment for the representative formulation MON 52276 that does not contain POEA.
932	Ecotoxicology	Milan M. et al.	2018	Ecotoxicological effects of the herbicide glyphosate in non-target aquatic species: Transcriptional responses in the mussel Mytilus galloprovincialis.	Environmental pollution (2018), Vol. 237, pp. 442-451	No control data are presented. The concept of up and down-regulation of genes following exposure to glyphosate within the context of a risk assessment is not relatable to the EU renewal. The purity of the test substance is not presented so dosing cannot be confirmed. The environmental conditions of the exposure phase are not presented other than salinity and temperature. No positive control included.
933	Ecotoxicology	Mingo V. et al.	2019	Validating buccal swabbing as a minimal-invasive method to detect pesticide exposure in squamate reptiles.	Chemosphere (2019), Vol. 229, pp. 529-537	This paper describes a novel approach to taking samples from wall lizards for subsequent enzymatic analysis for the detection of pesticide effects. No data were presented that could be used in an EU level RA for renewal. Non representative formulation.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
934	Ecotoxicology	Mona M. H. et al.	2013	Evaluation of cytotoxic effects of atrazine and glyphosate herbicides on Biomphalaria glabrata snails.	Journal of Basic and Applied Zoology (2013), Vol. 66, No. 2, pp. 68-75	Paper discusses a RAPD-PCR technique for detecting genotoxic damage. Formulation tested (Herfosat, Egypt; not characterized/described further). The data are not relatable to an EU level risk assessment for Annex I renewal.
935	Ecotoxicology	Mondal S. et al.	2017	Phytotoxicity of glyphosate in the germination of Pisum sativum and its effect on germinated seedlings.	Environmental health and toxicology (2017), Vol. 32, pp. e2017011	Test design not relevant to EU level ecotoxicological risk assessment for Annex I renewal.
936	Ecotoxicology	Monquero P. A. et al.	2016	Initial growth of tree species under herbicide drift.	Revista de Ciencias Agrarias / Amazonian Journal of Agricultural and Environmental Sciences (2016), Vol. 59, No. 2, pp. 162-172	Direct application to trees is not a proposed use of glyphosate and such end-points are not used in the EE level risk assessment for glyphosate renewal.
937	Ecotoxicology	Monte T. C. C. et al.	2019	Changes in hemocytes of Biomphalaria glabrata infected with Echinostoma paraensei and exposed to glyphosate-based herbicide.	Journal of invertebrate pathology (2019), Vol. 160, pp. 67-75	Relates to snails being exposure to a formulation of glyphosate that is not the representative formulation at Annex I for the EU.
938	Ecotoxicology	Moore L. J. et al.	2012	Relative toxicity of the components of the original formulation of Roundup to five North American anurans.	Ecotoxicology and environmental safety (2012), Vol. 78, pp. 128-33	Whilst the study is well described and data on the formulation and on the surfactant are presented, both test substances are not relevant to the EU renewal of the representative formulation MON52276, which does not contain POEA. Whilst the presented data for these two substances, are supported by the data presented in the paper, there is insufficient information presented to conclude on the assay conducted with the IPA salt of glyphosate. There are no specific biological results presented for anurans exposed to the glyphosate IPA exposure salt in this paper, the finding for the IPA salt can only be considered in a supportive way. All data presented for MON 2139 and MON 0818 are not relevant to the EU level risk assessment of glyphosate for Annex I renewal.
939	Ecotoxicology	Moreira L. F. et al.	2019	Modulation of the multixenobiotic resistance mechanism in Danio rerio hepatocyte culture (ZF-L) after exposure to glyphosate and Roundup (R).	Chemosphere (2019), Vol. 228, pp. 159-165	Epigenetic biomarkers are indicators of the presence of a chemical or mixture of chemicals in the environment. They are not indicators of toxicity. The endpoints presented are not relatable to the ecotoxicological risk assessment required for Annex I renewal in the EU.
940	Ecotoxicology	Morgan M. A. et al.	2019	Evaluating sub-lethal stress from Roundup (R) exposure in Artemia franciscana using H-1 NMR and GC-MS.	Aquatic Toxicology (2019), Vol. 212, pp. 77-87	Formulation used contains POEA - not relevant therefore to EU renewal.
941	Ecotoxicology	Morris A. et al.	2016	Effect of two commercial herbicides on life history traits of a human disease vector, Aedes aegypti, in the laboratory setting.	Ecotoxicology (2016), Vol. 25, No. 5, pp. 863-70	No relevant information on metabolism / residues / background levels of glyphosate. Epidemiology, effect of glyphosate on Aedes aegypti.
942	Ecotoxicology	Mottier A. et al.	2015	Effects of subchronic exposure to glyphosate in juvenile oysters (Crassostrea gigas): From molecular to individual levels.	Marine pollution bulletin (2015), Vol. 95, No. 2, pp. 665-77	Endpoints based on gene expressions are not considered in an ecotoxicology risk assessment for Annex I renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
943	Ecotoxicology	Mugni H. et al.	2014	Acute toxicity of roundup to the nontarget organism Hyalella curvispina. Laboratory and field study	Toxicological and environmental chemistry (2014), Vol. 96, No. 7, pp. 1054-1063	Not the representative formulation for the Annex I therefore not relevant to the risk assessment for Annex I renewal.
944	Ecotoxicology	Munoz L. M. H. et al.	2015	Toxicity assesment of two agrochemicals, roundup active and cosmo-Flux411F, to colombian anuran tadpoles	Acta Biologica Colombiana (2015), Vol. 20, No. 2, pp. 153-161	Roundup Active is based on the potassium salt of glyphosate and contains a different surfactant system compared with the representative formulation for the Annex I EU renewal. It is therefore not relevant to the ecotoxicology risk assessment as effects cannot be related to the representative formulation.
945	Ecotoxicology	Murugan K. et al.	2014	Eudrilus eugeniae - a potent bioremediator in controlling herbicide and pesticide pollution.	International Journal of Pharmaceutical and Biological Archives (2014), Vol. 5, No. 5, pp. 67-74	Paper discusses the use of earthworm as bioremediation organisms to remove glyphosate from the soil. The endpoints presented are not relatable to an EU level risk assessment for Annex I renewal.
946	Ecotoxicology	Murussi C. R. et al.	2016	Exposure to different glyphosate formulations on the oxidative and histological status of Rhamdia quelen.	Fish physiology and biochemistry (2016), Vol. 42, No. 2, pp. 445-55	Findings cannot be related to an EU level ecotoxicology risk assessment
947	Ecotoxicology	Mysore D. K. et al.	2013	Effect of metabolic inhibitors on growth and carotenoid production in Dunaliella bardawil.	Journal of food science and technology (2013), Vol. 50, No. 6, pp. 1130-6	Formulation tested contains tallow amine surfactant - not relevant to EU renewal.
948	Ecotoxicology	Nascentes R. F. et al.	2018	Low doses of glyphosate enhance growth, CO2 assimilation, stomatal conductance and transpiration in sugarcane and eucalyptus.	Pest management science (2018), Vol. 74, No. 5, pp. 1197-1205	This paper discusses hormetic responses of sugar cane and eucalyptus plants following exposure to low doses of glyphosate. The exposure situation and the presented endpoint data are not relevant to the EU level renewal of glyphosate
949	Ecotoxicology	Navarro C. D. C. et al.	2014	Effects of the surfactant polyoxyethylene amine (POEA) on genotoxic, biochemical and physiological parameters of the freshwater teleost Prochilodus lineatus.	Comparative biochemistry and physiology. Toxicology & pharmacology (2014), Vol. 165, pp. 83-90	Contains POEA, therefore not relevant to EU renewal.
950	Ecotoxicology	Niemeyer J. C. et al.	2018	Do recommended doses of glyphosate-based herbicides affect soil invertebrates? Field and laboratory screening tests to risk assessment.	Chemosphere (2018), Vol. 198, pp. 154-160	The study is considered not relevant as it is conducted with Roundup Original. Despite the content being 360 g a.e./L, this product in Brazil is based on MON 78087, which contains MON 0818 which is a surfactant system containing POEA. This is not a relevant surfactant for the Annex I submission and therefore data generated using this formulation is not relevant to the EU Annex I renewal process from an ecototoxicology perspective.
951	Ecotoxicology	Nocelli R. C. F. et al.	2019	EFFECTS OF HERBICIDES ON THE SURVIVAL OF THE BRAZILIAN NATIVE BEE Melipona scutellaris LATREILLE, 1811 (HYMENOPTERA: APIDAE)	PLANTA DANINHA (2019), Vol. 37, pp. 1	End-points based on LT50 (time until 50% lethality, are not considered in an EU level bee risk assessment. Exposure scenario is not relevant to the risk assessment as bees were exposed for up to 45 days, being fed continuously and therefore not relatable to an exposure situation in the field.
952	Ecotoxicology	Nur Masirah M. Z. et al.	2013	Effects of selected herbicides on soil microbial populations in oil palm plantation of Malaysia: a microcosm experiment.	African Journal of Microbiology Research (2013), Vol. 7, No. 5, pp. 367-374	Non-EU monitoring study - not relatable to an EU level ecotoxicology risk assessment for Annex I renewal of glyphosate.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
953	Ecotoxicology	Nwani C. D. et al.	2013	Investigation on acute toxicity and behavioral changes in Tilapia zillii due to glyphosate-based herbicide, forceup.	JAPS, Journal of Animal and Plant Sciences (2013), Vol. 23, No. 3, pp. 888-892	The study was not conducted to GLP and a relevant guideline was not followed. The glyphosate formulation used in the study was Forceup and therefore the toxicity of the active substance to this fish species is unclear from this article. There was no rationale for the selection of exposure concentrations presented and no analytical verification of test concentrations was reported during the semi-static test procedure. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
954	Ecotoxicology	Nwani C. D. et al.	2010	Lethal concentration and toxicity stress of Carbosulfan, Glyphosate and Atrazine to freshwater air breathing fish Channa punctatus (Bloch).	International Aquatic Research (2010), Vol. 2, No. 2, pp. 105-111	Glyphosate products used to look at toxicity to Snakehead fish relevant to the Indian subcontinent. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU renewal
955	Ecotoxicology	Nweke C. O. et al.	2015	Prediction of phenolic compounds and formulated glyphosate toxicity in binary mixtures using Rhizobium species dehydrogenase activity.	Advances in Life Sciences (2015), Vol. 5, No. 2, pp. 27-38	Mixture study
956	Ecotoxicology	Oliveira Souza C. et al.	2014	Exopolysaccharides and abiotic stress tolerance in bacterial isolates from "sabia" nodules.	Revista Caatinga (2014), Vol. 27, No. 4, pp. 240-245	Paper discusses a novel approach of assessing abiotic stress tolerance in bacterial isolates. Achieved dataset is not relatable to an EU level risk assessment.
957	Ecotoxicology	Olszyk D. et al.	2010	Phytotoxicity assay for seed production using Brassica rapa L.	Integrated environmental assessment and management (2010), Vol. 6, No. 4, pp. 725-34	Development of an assay to look at impact of glyphosate (and other pesticides) on the seed production of plant species with a short life cycle. End-points cannot be used in the regulatory risk assessment of glyphosate.
958	Ecotoxicology	Olszyk D. et al.	2010	Potato (Solanum tuberosum) greenhouse tuber production as an assay for asexual reproduction effects from herbicides.	Environmental toxicology and chemistry (2010), Vol. 29, No. 1, pp. 111-21	Study to look at effect of glyphosate product (and other chemistry) on potato plants asexual reproduction to develop an assay. EC25 values generated for glyphosate and effect on fresh weight on potato tuber and shoot weight. Not relevant to the regulatory risk assessment of glyphosate renewal.
959	Ecotoxicology	Omran N. E. et al.	2016	The endocrine disruptor effect of the herbicides atrazine and glyphosate on Biomphalaria alexandrina snails.	Toxicology and industrial health (2016), Vol. 32, No. 4, pp. 656-65	Cellular level end-points are not relatable to an EU level ecotoxicology assessment for AIR 5.
960	Ecotoxicology	Orsted M. et al.	2015	A fluorescence-based hydrolytic enzyme activity assay for quantifying toxic effects of Roundup (R) to Daphnia magna.	Environmental Toxicology and Chemistry (2015), Vol. 34, No. 8, pp. 1841-1850	Describes a novel fluorescence technique that is not relevant to EU level ecotoxicology risk assessment for Annex I renewal.
961	Ecotoxicology	Orun I. et al.	2013	Effects of acute and chronic exposure to glyphosate on common carp (Cyprinus carpio L.) hematological parameters: the beneficial effect of propolis.	Fresenius Environmental Bulletin (2013), Vol. 22, No. 9, pp. 2504-2509	The article does not report results, which can be used for ecotoxicology risk assessment for Annex I renewal purposes. Contains cellular and molecular findings

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962	Ecotoxicology	Owagboriaye F. et al.	2020	Biochemical response and vermiremediation assessment of three earthworm species (Alma millsoni, Eudrilus eugeniae and Libyodrilus violaceus) in soil contaminated with a glyphosate-based herbicide.	Ecological Indicators (2020), Vol. 108, pp. 105678	Endpoints based on effects on enzymes levels in earthworms are not used in the EU level ecotoxicology risk assessment for renewal under Annex I. Concerning exposure, based on 83.2g a.i./m^2 equivalent, the corresponding application rate per hectare is 832,000 g/ha, equal to 832 kg/ha. This rate far exceeds proposed EU application rate max of 2.16 kg/ha. Therefore findings are difficult to relate to an EU exposure scenario. The product used was also not the representative formulation proposed in the Annex I dossier.
963	Ecotoxicology	Luaces J. P. et al.	2017	Genotoxic effects of Roundup Full II (R) on lymphocytes of Chaetophractus villosus (Xenarthra, Mammalia): In vitro studies.	PLoS One (2017), Vol. 12, No. 8, pp. Article No. e0182911	Cellular level endpoints cannot be related to the ecotoxicology Annex I renewal risk assessment.
964	Ecotoxicology	Pala A.	2019	The effect of a glyphosate-based herbicide on acetylcholinesterase (AChE) activity, oxidative stress, and antioxidant status in freshwater amphipod: Gammarus pulex (Crustacean).	Environmental science and pollution research international (2019), Vol. 26, No. 36, pp. 36869-36877	Roundup was used which contains POEA. This is not the representative formulation for the Annex I renewal.
965	Ecotoxicology	Panda N. et al.	2016	Herbicides impact on Fe and Mn reduction and dehydrogenase activity in an agricultural soil.	Journal of Crop and Weed (2016), Vol. 12, No. 3, pp. 142-149	Comparitive effects on Fe and Mn transformation and dehydrogenase activity in soils are not endpoints used in the EU level ecotoxicology risk assessment for Annex I renewal.
966	Ecotoxicology	Patkowski M. et al.	2016	Response of soil phosphatases to glyphosate and its formulations - Roundup (laboratory conditions).	Plant, Soil and Environment (2016), Vol. 62, No. 6, pp. 286-292	Technical data cannot be related to an EU level Annex I ecotoxicology risk assessment. Formulations used contain POEA.
967	Ecotoxicology	Peel M. D. et al.	2013	Natural Glyphosate Tolerance in Sainfoin (Onybrychis viciifolia).	Crop Science (2013), Vol. 53, No. 5, pp. 2275-2282	Paper discusses tolerance to glyphosate a comparison with two plants types. Endpoints specific to EU level ecotoxicology risk assessment are not presented.
968	Ecotoxicology	Pereira J. L. et al.	2018	Effects of glyphosate on the non-target leaf beetle Cerotoma arcuata (Coleoptera: Chrysomelidae) in field and laboratory conditions.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2018), Vol. 53, No. 7, pp. 447-453	The work was based on populations associated with applications made to glyphosate resistant soybeans. Over the top applications to traited crops are not relevant to the Annex I GAP table. The formulation used was Roundup Original, which contains POEA and is not included in the representative formulation (MON 52276), therefore findings of the study based on a formulation containing POEA are not considered relevant to the EU level RA. for Annex I purposes.
969	Ecotoxicology	Perez-Iglesias J. M. et al.	2016	Effects of glyphosate on hepatic tissue evaluating melanomacrophages and erythrocytes responses in neotropical anuran Leptodactylus latinasus.	Environmental science and pollution research international (2016), Vol. 23, No. 10, pp. 9852-61	Presents cellular and morphological level information that cannot be related to an EU level ecotoxicology risk assessment for Annex I renewal.
970	Ecotoxicology	Persch T. S. P. et al.	2018	Changes in intermediate metabolism and oxidative balance parameters in sexually matured three-barbeled catfishes exposed to herbicides from rice crops (Roundup(®), Primoleo(®) and Facet(®)).	Environmental toxicology and pharmacology (2018), Vol. 58, pp. 170-179	Relates to snails being exposure to a formulation of glyphosate that is not the representative formulation at Annex I for the EU.

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971	Ecotoxicology	Pfleeger T. et al.	2014	Effects of single and multiple applications of glyphosate or aminopyralid on simple constructed plant communities.	Environmental toxicology and chemistry (2014), Vol. 33, No. 10, pp. 2368-78	This paper looks at response of plant communities following multiple application scenarios across multiple years. Endpoints in terms of plant volume are not relatable to and EU level Ecotoxicology risk assessment for Annex I renewal.
972	Ecotoxicology	Pfleeger T. et al.	2010	Comparing effects of low levels of herbicides on greenhouse- and field-grown potatoes (Solanum tuberosum L.), soybeans (Glycine max L.), and peas (Pisum sativum L.)	Environmental Toxicology and Chemistry (2010), Vol. 30, No. 2, pp. 455-468	Study to compare effects of glyphosate on greenhouse and field grown potatoes, soybean and peas to determine if greenhouse studies are protective of field conditions. Conducted by US EPA. EC25 values generated but as the paper is comparing effect in and outside the greenhouse, the data does not contribute to the regulatory risk assessment of the glyphosate renewal.
973	Ecotoxicology	Piola L. et al.	2013	Comparative toxicity of two glyphosate-based formulations to Eisenia andrei under laboratory conditions.	Chemosphere (2013), Vol. 91, No. 4, pp. 545-51	End-points not relatable to an EU level ecotoxicology risk assessment for Annex I renewal.
974	Ecotoxicology	Pizarro H. et al.	2016	Impact of multiple anthropogenic stressors on freshwater: how do glyphosate and the invasive mussel Limnoperna fortunei affect microbial communities and water quality?.	Ecotoxicology (2016), Vol. 25, No. 1, pp. 56-68	The paper looks at the synergistic effects of glyphosate and freshwater mussels on eutrophication in surface waters. Not relatable to an EU level ecotoxicology risk assessment for Annex I renewal.
975	Ecotoxicology	Pochron S. et al.	2019	Temperature and body mass drive earthworm (Eisenia fetida) sensitivity to a popular glyphosate-based herbicide	Applied soil ecology (2019), Vol. 139, pp. 32-39	Formulation used is not the representative formulation for the Annex I renewal.
976	Ecotoxicology	Poletta G. L. et al.	2017	Biomarkers of Environmental Contamination in Reptile Species: The Effect of Pesticide Formulations on Broad-snouted Caiman Caiman latirostris (Crocodilia, Alligatoridae).	Larramendy, ML [Editor]. (2017) pp. 467-517. Ecotoxicology and Genotoxicology: Non-Traditional Aquatic Models. Publisher: ROYAL SOC CHEMISTRY, ISSN: 1757-7179.	Cellular and molecular level findings cannot be related to an EU level ecotoxicology risk assessment, a book chapter.
977	Ecotoxicology	Polyakova N. N. et al.	2018	Effect of herbicides application on the soil biological activity in the tree nursery	Agrokhimiya (2018), Vol. 12, pp. 35-41	The paper describes the use of buried linen to establish the activity of microorganisms in the soil during a 2 year monitoring period in a tree nursery. The observations cannot be related to an EU level risk assessment as they are based on visual inspection / qualitative assessment of the amount of apparent breakdown of the linen.
978	Ecotoxicology	de Oliveira Procopio S. et al.	2014	Toxicity of herbicides used in the sugarcane crop to diazotrophic bacterium Herbaspirillum seropedicae.	Semina: Ciencias Agrarias (2014), Vol. 35, No. 5, pp. 2383-2398	Paper discusses the impact of glyphosate on cell densities of soil bacteria tested in liquid culture and using novel assay approaches. The endpoints cannot be related to an EU level ecotoxicology risk assessment for renewal.
979	Ecotoxicology	Qin Y. et al.	2017	Toxic effects of glyphosate on diploid and triploid fin cell lines from Misgurnus anguillicaudatus.	Chemosphere (2017), Vol. 180, pp. 356-364	Cellular level endpoints cannot be related to the ecotoxicology Annex I renewal risk assessment.
980	Ecotoxicology	Reddy S. B. et al.	2018	Disturbances in reproduction and expression of steroidogenic enzymes in aquatic invertebrates exposed to components of the herbicide Roundup	Toxicology Research and Application (2018), Vol. 2, pp. 2397847318805276/1	Findings cannot be related to an EU level ecotoxicology risk assessment, as the methods used are not recognised at the EU level.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
981	Ecotoxicology	Reis L. A. C. et al.	2018	Leaf morphoanatomy and biochemical variation on coffee cultivars under drift simulation of glyphosate.	Planta Daninha (2018), Vol. 36, pp. E018143560	Findings not relatable to an EU level ecotoxicology risk assessment for product renewal in the EU.
982	Ecotoxicology	Reno U. et al.	2014	The impact of Eskoba, a glyphosate formulation, on the freshwater plankton community.	Water environment research (2014), Vol. 86, No. 12, pp. 2294-300	Overall the study was well described and conducted partially in accordance with OECD Guideline No. 201. The endpoints measured within the study included survival, age of reproduction, and fecundity. However, validity criteria on mortality was exceeded in the control organisms for several intervals. Analytical measurements were only performed on stock solution. Second part of the study was performed with native micro-crustacean species in Argentina. The test exposure history to the organisms was unknown as they were collected within the local environment. Finally, the glyphosate formulation Eskoba. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
983	Ecotoxicology	Reno U. et al.	2018	Effects of glyphosate formulations on the population dynamics of two freshwater cladoceran species.	Ecotoxicology (2018), Vol. 27, No. 7, pp. 784-793	Formulation used is not the representative formulation for the Annex I renewal.
984	Ecotoxicology	Reno U. et al.	2016	Water polluted with glyphosate formulations: effectiveness of a decontamination process using Chlorella vulgaris growing as bioindicator	Journal of applied phycology (2016), Vol. 28, No. 4, pp. 2279-2286	Study conducted using Roundup ultramax (AKA Mon 78784) that contains surfactants that are different to those used in MON 52276. Therefore findings cannot be related to the ecotoxicology assessment for Annex I renewal for MON 52276
985	Ecotoxicology	Rezende-Silva S. L. et al.	2019	Pouteria torta is a remarkable native plant for biomonitoring the glyphosate effects on Cerrado vegetation	Ecological indicators (2019), Vol. 102, pp. 497-506	Formulation not the representative formulation for the Annex I renewal. Enzymatic endpoints are not relevant to an EU level risk assessment
986	Ecotoxicology	Richard S. et al.	2014	Effect of a glyphosate-based herbicide on gene expressions of the cytokines interleukin-1β and interleukin-10 and of heme oxygenase-1 in European sea bass, Dicentrarchus labrax L.	Bulletin of environmental contamination and toxicology (2014), Vol. 92, No. 3, pp. 294-9	End-points based on gene expression are not considered in the EU level Annex I ecotoxicology risk assessment for renewal.
987	Ecotoxicology	Robertson C.	2013	The Effects of the Glyphosate-based Herbicide WeatherMax RTM on Sexual Differentiation and Growth in the Wood Frog (Lithobates sylvaticus).	Masters Abstracts International (2013), Vol. 51, No. 06, pp. 171	The formulation used contains a surfactant system that is not relevant to the representative formulation being considered for the Annex I renewal in the EU.
988	Ecotoxicology	Rocha T. L. et al.	2015	Proteomic and histopathological response in the gills of Poecilia reticulata exposed to glyphosate-based herbicide.	Environmental toxicology and pharmacology (2015), Vol. 40, No. 1, pp. 175-86	Observed findings relate to a formulation that is not the representative formulation for the Annex I renewal in the EU.
989	Ecotoxicology	Rodriguez A. M. et al.	2018	Glyphosate Alters Aboveground Net Primary Production, Soil Organic Carbon and Nutrients in Pampean Grasslands (Argentina)	Rangeland ecology & management (2018), Vol. 71, No. 1, pp 119-125	This paper describes multi season monitoring of different habitats in Argentina, the findings of which cannot be related to an EU level risk assessment for Annex I renewal from an ecotoxicology perspective.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
990	Ecotoxicology	Rodriguez-Gil J. L. et al.	2017	Aquatic hazard assessment of MON 0818, a commercial mixture of alkylamine ethoxylates commonly used in glyphosate-containing herbicide formulations. Part 2: Roles of sediment, temperature, and capacity for recovery following a pulsed exposure.	Environmental toxicology and chemistry (2017), Vol. 36, No. 2, pp. 512-521	Contains POEA, therefore not relevant to EU renewal.
991	Ecotoxicology	Romano-Armada N. et al.	2019	Construction of a combined soil quality indicator to assess the effect of glyphosate application.	The Science of the total environment (2019), Vol. 682, pp. 639-649	Paper describes a new approach to establishing the quality of farmland soils by assessing multiple physical, chemical and biological quality factors of soils and attempting to classify these as being of high or low quality based on a known history of glyphosate or no glyphosate application. To this end, the paper does not describe endpoint data that can be related to an EU level Annex I submission.
992	Ecotoxicology	Rondon Neto R. M. et al.	2011	Phytotoxicity of Aspidosperma desmanthum under glyphosate drifting. Fitotoxidade de peroba-mica (Aspidosperma desmanthum) submetidas a deriva de glyphosate.	Revista Brasileira de Herbicidas (2011), Vol. 10, No. 2, 103 p	The study looks at the toxicity of glyphosate on seedlings of a tree species that is native to South America, Mexico and West Indies. The test substance was Gliz 480 SL (IPA salt). Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
993	Ecotoxicology	Roy N. M. et al.	2016	Glyphosate induces neurotoxicity in zebrafish.	Environmental toxicology and pharmacology (2016), Vol. 42, pp. 45-54	Endpoint not used in EU level ecotoxicology risk assessment
994	Ecotoxicology	Ruiz-Toledo J. et al.	2014	Effect of the concentration of glyphosate present in body waters near transgenic soybean fields on the honeybee Apis mellifera, and the stingless bee Tetragonisca angustula. Efecto de la concentracion de glifosato presente en cuerpos de agua cercanos a ca	Acta Zoologica Mexicana (2014), Vol. 30, No. 2, pp. 408-413	Non-EU monitoring study. Extrapolation to EU difficult.
995	Ecotoxicology	Ruuskanen S. et al.	2020	Female Preference and Adverse Developmental Effects of Glyphosate-Based Herbicides on Ecologically Relevant Traits in Japanese Quails.	Environmental science & technology (2020), Vol. 54, No. 2, pp. 1128-1135	Formulation used is not the representative formulation for the Annex I renewal.
996	Ecotoxicology	Saba R. M. et al.	2018	Toxicological and biochemical investigation of certain herbicides on Culex pipiens L. (Diptera: Culicidae) mosquitoes under laboratory conditions	Advances in Natural and Applied Sciences (2018), Vol. 12, No. 2, pp. 6-12	Non-representative formulation (Herbazd 48% EC) was tested. Test organisms were field collected with no knowledge of prior exposure to chemicals. Important information is missing in the material and methods section. The preparation and application of the test solutions as well as the tested concentration range were not reported. The test item is not adequately specified. Although the herbicide formulation is given with a purity of 48 %, it is not clear whether the test concentrations refer to the product or to the active substance. Moreover, the active ingredient is given as glyphosate isopropylamine which should be formulated as a salt resulting in test concentrations as acid equivalents. In addition, the biological results of the test were not sufficiently stated. No

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
						mortality data neither for the test concentrations nor for the controls was given to evaluate the results. Furthermore, there was no analytical verification of test concentrations reported, there is no study guideline and the study is non-GLP and thus the reliability of the study and its relatability to an EU level ecotoxicology risk assessment is questionable.
997	Ecotoxicology	Salbego J. et al.	2014	Glyphosate on digestive enzymes activity in piava (Leporinus obtusidens).	Ciencia Rural (2014), Vol. 44, No. 9, pp. 1603-1607	Study provides information on cellular/molecular level and is no ecotoxicological relevant study
998	Ecotoxicology	Salman J. M. et al.	2016	Effect of pesticide glyphosate on some biochemical features in cyanophyta algae oscillatoria limnetica.	International Journal of PharmTech Research (2016), Vol. 9, No. 8, pp. 355-365	Cellular and molecular level endpoints discussed that are not relevant to EU level ecotoxicology risk assessment.
999	Ecotoxicology	Salvio C. et al.	2016	Survival, Reproduction, Avoidance Behavior and Oxidative Stress Biomarkers in the Earthworm Octolasion cyaneum Exposed to Glyphosate.	Bulletin of environmental contamination and toxicology (2016), Vol. 96, No. 3, pp. 314-9	The earthworm were collected in field in Argentina and acclimatized for 2 weeks. Therefore, the organisms may have had exposure to other chemicals in the field. No information on the field history regarding application of pesticides is known. Analytical measurements of glyphosate were carried out in the short-term bioassay samples. While the test organisms, test design and procedure are well described and all information for the evaluation of the study is given, no endpoint considered relevant for use in risk assessment was determined. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
1000	Ecotoxicology	Samal S. et al.	2019	Setal anomalies in the tropical earthworms Drawida willsi and Lampito mauritii exposed to elevated concentrations of certain agrochemicals: An electron micrographic and molecular docking approach	Environmental technology & innovation (2019), Vol. 15, pp. 100391	Paper describes a electron microscopic approach for establishing effects of pesticides on setal in worms. The findings are not relatable to an EU level ecotoxicological risk assessment.
1001	Ecotoxicology	Samanta P. et al.	2014	Biochemical effects of glyphosate based herbicide, Excel Mera 71 on enzyme activities of acetylcholinesterase (AChE), lipid peroxidation (LPO), catalase (CAT), glutathione-S-transferase (GST) and protein content on teleostean fishes.	Ecotoxicology and environmental safety (2014), Vol. 107, pp. 120-5	Cellular level endpoints cannot be related to the ecotoxicology Annex I renewal risk assessment.
1002	Ecotoxicology	Samanta P. et al.	2014	Evaluation of metabolic enzymes in response to Excel Mera 71, a glyphosate-based herbicide, and recovery pattern in freshwater teleostean fishes.	BioMed research international (2014), Vol. 2014, pp. 425159	Cellular level end-points cannot be related to the ecotoxicology Annex I renewal risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1003	Ecotoxicology	Samanta P. et al.	2019	Assessment of adverse impacts of glyphosate-based herbicide, Excel Mera 71 by integrating multi-level biomarker responses in fishes	International Journal of Environmental Science and Technology (2019), Vol. 16, pp. 6291-6300	Molecular level endpoints, associated with biomarker responses are not part of the ecotoxicology risk assessment for fish for an Annex I renewal of a plant protection product in the EU. Observations are not relatable to the EU renewal of glyphosate. Not representative formulation.
1004	Ecotoxicology	Sanchez J. A. A. et al.	2017	Effects of Roundup formulations on biochemical biomarkers and male sperm quality of the livebearing Jenynsia multidentata.	Chemosphere (2017), Vol. 177, pp. 200-210	Formulations contain POEA and therefore not relevant to the EU level ecotoxicological risk assessment for Annex I renewal.
1005	Ecotoxicology	Sani A. et al.	2016	Acute toxicity of herbicide (glyphosate) in Clarias gariepinus juveniles.	Toxicology reports (2016), Vol. 3, pp. 513-515	No information on test substance and test design not recognised. Fish too big for use in study.
1006	Ecotoxicology	Santos S. A. et al.	2019	DIFFERENTIAL TOLERANCE OF CLONES OF Eucalyptus grandis EXPOSED TO DRIFT OF THE HERBICIDES CARFENTRAZONE-ETHYL AND GLYPHOSATE	PLANTA DANINHA (2019), Vol. 37	The study is considered not relevant as it is conducted with Roundup Original. Despite the content being 360 g a.e./L, this product in brazil is based on MON 78087, which contains MON 0818 which is a surfactant system containing POEA. This is not a relevant surfactant for the Annex I submission and therefore data generated using this formulation is not relevant to the EU Annex I renewal process from an ecotoxicology perspective.
1007	Ecotoxicology	Santric L. et al.	2016	Effects of herbicides on growth and number of actinomycetes in soil and in vitro.	Pesticidi i Fitomedicina (2016), Vol. 31, No. 3/4, pp. 121-128	No endpoints presented that can be used in an EU level ecotoxicology risk assessment for Annex I renewal.
1008	Ecotoxicology	Santric L. et al.	2018	THE EFFECTS OF NICOSULFURON AND GLYPHOSATE ON MICROBIAL ACTIVITY OF DIFFERENT SOILS	PLANTA DANINHA (2018), Vol. 36	Measured parameters are not used in the EU level ecotoxicology assessment for Annex I renewal. It cannot be confirmed that the product sued was the representative formulation.
1009	Ecotoxicology	Saunders L. E. et al.	2013	Root-zone glyphosate exposure adversely affects two ditch species.	Biology (2013), Vol. 2, No. 4, pp. 1488-96	The author describes a formulation that is not the representative formulation for the Annex I.
1010	Ecotoxicology	Seguin A. et al.	2017	Sub-lethal effects of a glyphosate-based commercial formulation and adjuvants on juvenile oysters (Crassostrea gigas) exposed for 35days.	Marine pollution bulletin (2017), Vol. 117, No. 1-2, pp. 348-358	Contains POEA, therefore not relevant to EU renewal.
1011	Ecotoxicology	Shaker B. K. et al.	2018	Effect of exposure to glyphosate pesticide, cadimum and chromium on biomass of algae (Chlorococcum humicola and chlorella vulgaris) in polluted aqueous culture.	Indian Journal of Public Health Research and Development (2018), Vol. 9, No. 10, pp. 708-713	End-points are based on exposure to both glyphosate and metals and therefore is considered a mixture. Therefore not relevant to EU level risk assessment for glyphosate renewal.
1012	Ecotoxicology	Sharifi Y. et al.	2015	Biodegradation of glyphosate herbicide by Salinicoccus spp isolated from Qom Hoze-soltan lake, Iran	Environmental Health Engineering and Management Journal (2015), Vol. 2, No. 1, pp. 31-36	Paper discusses the potential use of a bacterial strain for biodegrading of glyphosate in a freshwater lake in Iran. Not relevant to the Annex I renewal process in the EU.
1013	Ecotoxicology	Sheehan N. et al.	2018	Glyphosate-containing herbicide impacts physical and behavioral changes during head regeneration in Dugesia (Girardia) tigrina	Bios (2018), Vol. 89, No. 1, pp. 14-22	Formulation used is not the representative formulation for the Annex I renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1014	Ecotoxicology	Shimina V. S. et al.	2010	Effect of Herbicide Excel Mera-71 (Glyphosate) Treatment on Seed Germination and Early Seedling Growth of Black Gram (Vigna mungo, Hepper.) var. T-9.	Advances in Plant Sciences (2010), Vol. 23, No. 2, pp. 515-518	Conducted in India, GLY product used to look at the toxicity to germination, seedling growth in seedlings of black gram. Endpoint not relevant for the regulatory renewal of GLY.
1015	Ecotoxicology	Shiogiri N. S. et al.	2012	Acute exposure of a glyphosate-based herbicide affects the gills and liver of the Neotropical fish, Piaractus mesopotamicus.	Environmental toxicology and pharmacology (2012), Vol. 34, No. 2, pp. 388-396	Formulations contain POEA and therefore not relevant to the EU level ecotoxicology risk assessment for Annex I renewal.
1016	Ecotoxicology	Sikorski L. et al.	2019	The effects of glyphosate-based herbicide formulations on Lemna minor, a non-target species	Aquatic Toxicology (2019), Vol. 209, pp.70-80	Difficult to relate the findings to an EU level risk assessment for Annex I renewal as the study was conducted on a non-EU tree species.
1017	Ecotoxicology	Silveira T. et al.	2019	Roundup® Herbicide Decreases Quality Parameters of Spermatozoa of Silversides Odontesthes Humensis	Bulletin of Environmental Contamination and Toxicology (2019), Vol. 102, No. 1	Observations cannot be related to an ecotoxicology risk assessment for EU renewal of glyphosate.
1018	Ecotoxicology	Simoes T. et al.	2019	Fate and effects of two pesticide formulations in the invertebrate Folsomia candida using a natural agricultural soil.	The Science of the total environment (2019), Vol. 675, pp. 90-97	The formulation used (MONTANA) contains POEA which is not relevant to the EU level ecotoxicology risk assessment for Annex I renewal.
1019	Ecotoxicology	Simoes T. et al.	2018	An integrative omics approach to unravel toxicity mechanisms of environmental chemicals: effects of a formulated herbicide	Scientific Reports (2018), Vol. 8, No. 1, pp. 1-12	Study investigates the impact of a glyphosate formulation that contains POEA on Folsomia. This is not the formulated product for the renewal and POEA is no longer used in the EU.
1020	Ecotoxicology	Siroski P. A. et al.	2016	Immunotoxicity of commercial-mixed glyphosate in broad snouted caiman (Caiman latirostris).	Chemico-biological interactions (2016), Vol. 244, pp. 64-70	Monitoring endpoints not relevant to EU level ecotoxicology risk assessment
1021	Ecotoxicology	Siti Hanisah Zahuri et al.	2014	Toxicity testing of three commonly used herbicides on soil-dwelling ant (Family: Formicidae - Odontomachus simillimus).	Borneo Journal of Resource Science and Technology (2014), Vol. 4, No. 1, pp. 28-33	Review, secondary infomation.
1022	Ecotoxicology	Smedbol E. et al.	2018	Effects of low concentrations of glyphosate-based herbicide factor 540A® on an agricultural stream freshwater phytoplankton community	Chemosphere (2018), Vol. 192, pp. 133-141	Test substance not glyphosate or itsmetabolites. Paper presented based on a formulation of glyphosate that is not the representative formulation being considered for the Annex I renewal.
1023	Ecotoxicology	Smedbol E. et al.	2017	Phytoplankton growth and PSII efficiency sensitivity to a glyphosate-based herbicide (Factor 540(®)).	Aquatic toxicology (2017), Vol. 192, pp. 265-273	Achieved end-points are not relatable to an EU level ecotoxicology risk assessment for Annex I renewal.
1024	Ecotoxicology	Smith C. M. et al.	2019	Developmental and epigenetic effects of Roundup and glyphosate exposure on Japanese medaka (Oryzias latipes).	Aquatic toxicology (2019), Vol. 210, pp. 215-226	Single application rates for glyphosate active substance considered. No specific endpoints presented that could be applied to an EU level ecotoxicology risk assessment for Annex I renewal.
1025	Ecotoxicology	Soloneski S. et al.	2016	Genotoxic effect of a binary mixture of dicamba- and glyphosate-based commercial herbicide formulations on Rhinella arenarum (Hensel, 1867) (Anura, Bufonidae) late-stage larvae.	Environmental science and pollution research international (2016), Vol. 23, No. 17, pp. 17811-21	Despite LC50 data being present that could inform on the risk assessment - the formulation used (Credit®) is based on MON 35085, which is a 360 g/L formulation containing MON 0818, which contains POEA. These findings are therefore not relevant to the EU renewal as MON 52276 does not contain POEA.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1026	Ecotoxicology	Sribanjam S. et al.	2018	Toxic effects of the herbicide glyphosate on enzymes activities and histopathological changes in gill and liver tissue of freshwater fish, Silver barb (Barbonymus gonionotus)	Bioscience Research (2018), Vol. 15, No. 2, pp. 1251-1260	Data presented cannot be related to an EU level ecotoxicology risk assessment for Annex I renewal purposes. Roundup contains POEA which is not present in the representative formulation for the renewal.
1027	Ecotoxicology	Stefanello Junior G. J. et al.	2011	Selectivity of herbicides registered for corn at the immature stages of Trichogramma pretio sum (Hymenoptera: Trichogrammatidae). Seletividade de herbicidas registrados para a cultura do milho aos estadios imaturos de Trichogramma pretiosum (Hymenoptera:	Planta Daninha (2011), Vol. 29, pp. 1069-1077	Test species was parasitoid T. pretiosium in different immature stages (egg-larva, pre-pupal and pupal stages). However, the test solutions were sprayed onto egg-cards containing the parasitised eggs. Therefore this is not an adequate route of exposure and thus not relevant for the risk assessment.
1028	Ecotoxicology	Stenoien C. et al.	2018	Monarchs in decline: a collateral landscape-level effect of modern agriculture. Special Section: The impact of transgenic crops on protected arthropods.	Insect Science (2018), Vol. 25, No. 4, pp. 528-541	Concerns a review of the decline of monarch butterflies in the US. Not relatable to an EU level assessment for Annex I renewal.
1029	Ecotoxicology	Sulukan E. et al.	2017	An approach to clarify the effect mechanism of glyphosate on body malformations during embryonic development of zebrafish (Daino rerio).	Chemosphere (2017), Vol. 180, pp. 77-85	Endpoints are not relatable to an EU level risk assessment for Annex I renewal.
1030	Ecotoxicology	Sun K.-F. et al.	2013	Ecological risks assessment of organophosphorus pesticides based on response of Scenedesmus quadricanda.	China Environmental Science (2013), Vol. 33, No. 5, pp. 868-873	Endpoints not relevant to an EU level ecotoxicology risk assessment as they are not relatable.
1031	Ecotoxicology	Sun K.-F. et al.	2013	Ecological risks assessment of organophosphorus pesticides on bloom of Microcystis wesenbergii	International biodeterioration & biodegradation (2013), Vol. 77, pp. 98-105	Endpoints measured are not relevant or relatable to an EU level Annex I ecotoxicological risk assessment.
1032	Ecotoxicology	Sushilkumar et al.	2017	Herbicides effect on fish mortality and water quality in relation to chemical control of alligator weed.	Indian Journal of Weed Science (2017), Vol. 49, No. 4, pp. 396-400	Methods and end-points not relatable to EU level ecotoxicology assessment for renewal purposes.
1033	Ecotoxicology	Sushilkumar et al.	2017	Chemical control of duck weed and its effect on water quality and residue.	Indian Journal of Weed Science (2017), Vol. 49, No. 1, pp. 105-107	Difficult to relate observed findings to an EU level risk assessment for Annex I renewal.
1034	Ecotoxicology	Tang Y. et al.	2014	The influence of three different types of herbicides on biodiversity	Advanced Materials Research (2014), Vol. 838-841, pp. 2417-2426	Information presented is not directly relevant to the ecotoxicology risk assessment for Annex I renewal
1035	Ecotoxicology	Tapkir S. D. et al.	2019	Impact, recovery and carryover effect of Roundup® on predator recognition in common spiny loach, Lepidocephalichthys thermalis.	Ecotoxicology (2019), Vol. 28, No. 2, pp. 189-200	The formulation is not the representative formulation being used for the Annex 1. Its identity cannot be confirmed. The observed effects based on reactions to non-specific alarms / cues cannot be related to an EU level ecotoxicology risk assessment for Annex I renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1036	Ecotoxicology	Tkaczuk C. et al.	2016	The influence of selected pesticides on the growth of entomopathogenic fungi from the entomophthoralean order (Entomophthorales). Wpyw wybranych srodkow ochrony roslin na wzrost grzybow owadobojczych z rzedu owadomorkowcow (Entomophthorales).	Annales Universitatis Mariae Curie-Skodowska. Sectio E, Agricultura (2016), Vol. 71, No. 1, pp. 65-75	Test design not relevant to an EU level ecotoxicology risk assessment to support Annex I renewal.
1037	Ecotoxicology	Topal A. et al.	2015	Effects of glyphosate on juvenile rainbow trout (Oncorhynchus mykiss): transcriptional and enzymatic analyses of antioxidant defence system, histopathological liver damage and swimming performance.	Ecotoxicology and environmental safety (2015), Vol. 111, pp. 206-14	Cellular and molecular level results, not considered relevant to EU level ecotoxicology risk assessment.
1038	Ecotoxicology	Triana Velasquez T. M. et al.	2013	Lethal and Sublethal Effects of Glyphosate (Roundup (R) Active) to Embryos of Colombian Anurans. Original Title: EFECTOS LETALES Y SUBLETALES DEL GLIFOSATO (ROUNDUP (R) ACTIVO) EN EMBRIONES DE ANUROS COLOMBIANOS.	Acta Biologica Colombiana (2013), Vol. 18, No. 2, pp. 271-278	The formulation data presented in the paper are for a formulation that is not the representative formulation for the Annex I renewal.
1039	Ecotoxicology	Udeh G. N. et al.	2014	Acute toxicity of Delsate® herbicide (glyphosate) on albumin and blood urea nitrogen of African catfish, Clarias gariepinus (Burchell, 1822).	Journal of Aquatic Sciences (2014), Vol. 29, No. 2, pp. 309-315	Test item is a formulation other than the representative formulation.
1040	Ecotoxicology	Udeh G. N. et al.	2014	Behavioural and some physico-chemical assessment of fresh water catfish Clarias gariepinus (Burchell, 1822) exposed to acute concentrations of Delsate® herbicide (glyphosate).	Journal of Aquatic Sciences (2014), Vol. 29, No. 2, pp. 275-283	Contains a surfactant system that is not relevant to the EU level ecotoxicology risk assessment for renewal of MON 52276 onto Annex I.
1041	Ecotoxicology	Ujszegi J. et al.	2015	No observable effect of a glyphosate-based herbicide on two top predators of temporal water bodies.	Environmental toxicology and chemistry (2015), Vol. 34, No. 2, pp. 307-13	The test substance contains polyethoxylated tallowamine surfactant, which is not allowed in herbicidal formulations in the EU. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.
1042	Ecotoxicology	Ujszegi J. et al.	2016	NO EFFECT OF A GLYPHOSATE-BASED HERBICIDE ON LARVAL DRAGONFLIES (AESHNA CYANEA) AND ADULT NEWTS (LISSOTRITON VULGARIS) IN A LABORATORY-BASED EXPERIMENT.	Acta Zoologica Academiae Scientiarum Hungaricae (2016), Vol. 62, No. 4, pp. 355-367	The test substance contains polyethoxylated tallowamine surfactant, which is not allowed in herbicidal formulations in the EU. Due to the test materials not being the representative formulation for the EU renewal, the study is not relevant to the EU level Annex I ecotoxicology risk assessment.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1043	Ecotoxicology	Vajargah M. F. et al.	2018	Acute toxicity effect of glyphosate on survival rate of common carp, Cyprinus carpio	Environmental Health Engineering and Management Journal (2018), Vol. 5, No. 2, pp. 61-66	Non-representative formulation (Glyphosate Aria 41% SL) was tested. The test conditions throughout the whole exposure period were not documented. No information on source and composition of test media reported. There was no analytical verification of test concentrations reported and the study is not conducted according to a recognised test guideline. No validity criteria are stated so the validity of the study cannot be confirmed The size of the fish used in the test results in a fish loading rate of 1.23 g fish/Litre, which exceeds the loading rate required by internationally recognised fish testing guidelines. The testing design is not properly described i.e. whether a static, static renewal or flow through test design was used. The water quality parameters measured would suggest that the environmental conditions were maintained for the exposure duration, although this can also not be confirmed from the information presented. The water temperature being maintained at 26±1 ºC, exceeds the upper temperature limit for testing with Cyprinus carpio (24 ºC).
1044	Ecotoxicology	Vannini A. et al.	2016	Bioaccumulation, physiological and ultrastructural effects of glyphosate in the lichen Xanthoria parietina (L.) Th. Fr.	Chemosphere (2016), Vol. 164, pp. 233-240	Article discusses the use of lichens as a bioindicator model of glyphosate exposure. Not relatable to an EU level ecotoxicology risk assessment for the renewal of Glyphosate onto Annex I in the EU.
1045	Ecotoxicology	Veeraiah K. et al.	2015	Impact of glyphosate on biochemical constituents of the freshwater fish, catla catla	International Journal of Bioassays (2015), Vol. 4, No. 7, pp. 4139-4144	Formulation is not the representative formulation for the Annex I renewal.
1046	Ecotoxicology	Vera M. S. et al.	2012	Direct and indirect effects of the glyphosate formulation Glifosato Atanor® on freshwater microbial communities.	Ecotoxicology (2012), Vol. 21, No. 7, pp. 1805-16	On review of the paper, the findings of the study conducted in Argentina were difficult to relate to the EU level ecotoxicology risk assessment. The formulation used differs to the representative formulation for the Annex I in the EU.
1047	Ecotoxicology	Vera-Candioti J. et al.	2013	Evaluation of the genotoxic and cytotoxic effects of glyphosate-based herbicides in the ten spotted live-bearer fish Cnesterodon decemmaculatus (Jenyns, 1842).	Ecotoxicology and environmental safety (2013), Vol. 89, pp. 166-73	Formulations used are not relevant to the Annex I renewal of glyphosate in the EU.
1048	Ecotoxicology	Verderame M. et al.	2019	How Glyphosate Impairs Liver Condition in the Field Lizard Podarcis siculus (Rafinesque-Schmaltz, 1810): Histological and Molecular Evidence.	BioMed research international (2019), Vol. 2019, pp. 4746283	Sub-lethal endpoints based on blood chemistry analysis are not relatable to an EU level Annex I risk assessments.
1049	Ecotoxicology	Viti M. L. et al.	2019	Translocation and Root Exudation of Glyphosate by Urochloa brizantha and its Transport on Sugarcane and Citrus Seedlings	Planta Daninha (2019), Vol. 37	Paper discusses the translocation potential of glyphosate via the root zone, after application to palisade grass planted in association with sugar-cane. No endpoints relevant for an EU level eocotoxicology assessment.
1050	Ecotoxicology	Vllasaku I. et al.	2018	Investigation of genotoxic effect of herbicid Randap 480 ec at goldfish (Carassius auratus)	International Journal of Pharmaceutical Sciences Review and Research (2018), Vol. 48, No. 1, pp. 7/1-7/3	Identity of the formulated product used is not the same as the representative formulation being considered for the Annex I.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1051	Ecotoxicology	Voeroes M. et al.	2019	Influence of agro-environmental pollutants on a biocontrol strain of Bacillus velezensis	MicrobiologyOpen (2019), Vol. 8, No. 3, pp. e660	This paper discusses the impact of glyphosate on pesticide resistance strains of biocontrol agents. This is not considered relevant to an EU level ecotoxicology risk assessment for EU Annex I renewal.
1052	Ecotoxicology	Vrisman C. M. et al.	2014	Influence of herbicides and fungicides in the carpogenic germination of sclerotia of Sclerotinia sclerotiorum (Lib.) de Bary. Influencia de herbicidas e fungicidas na germinacao carpogenica de esclerodios de Sclerotinia sclerotiorum (Lib.) de Bary.	Bioscience Journal (2014), Vol. 30, No. 2, pp. 477-483	Study describes the impact of multiple pesticides on the germination of Sclerotina scleroteroium - a soil fungus. The end-points are not useable in an EU level Anneix ecotox risk assessment. 400 L/ha (if this were the representative formulation) would be equivalent to 1440 kg/ha significantly higher than any application rate proposed. Therefore this is not relatable to EU level ecotoxicology risk assessment.
1053	Ecotoxicology	Wagner N. et al.	2013	Effects of water contamination on site selection by amphibians: experiences from an arena approach with European frogs and newts.	Archives of environmental contamination and toxicology (2013), Vol. 65, No. 1, pp. 98-104	Novel choice / avoidance end-point data are not considered as part of an EU level ecotoxicology risk assessment for Annex I renewal.
1054	Ecotoxicology	Wagner N. et al.	2017	Population and life-stage-specific effects of two herbicide formulations on the aquatic development of European common frogs (Rana temporaria).	Environmental toxicology and chemistry (2017), Vol. 36, No. 1, pp. 190-200	The study was not conducted according to GLP, but it is well documented and in accordance with an ASTM standard protocol. The authors state that in all 3 breeding ponds, glyphosate was detected but not aminomethylphosphonic. However, the non-EU representative glyphosate formulation, Roundup® UltraMax, was tested. Therefore the study only provides supportive information.
1055	Ecotoxicology	Wagner N. et al.	2017	Effects of a commonly used glyphosate-based herbicide formulation on early developmental stages of two anuran species.	Environmental science and pollution research international (2017), Vol. 24, No. 2, pp. 1495-1508	Not the representative formultion for the Annex I renewal. Therefore not relevant to EU renewal.
1056	Ecotoxicology	Wagner N. et al.	2017	Corrigendum [Erratum to document cited in CA166:057881]	Environmental Toxicology and Chemistry (2017), Vol. 36, No. 1, pp. 276	This is a corregendium for an article (No. 2248), which is classified as non-relevant.
1057	Ecotoxicology	Wang F. et al.	2014	Acute Toxicity and Oxidative Stress of Two Herbicides on Earthworm Eisenia fetida.	Asian Journal of Ecotoxicology (2014), Vol. 9, No. 6, pp. 1210-1218	The achieved acute end-points are not considered relevant to an EU level ecotox risk assessment for renewal purposes.
1058	Ecotoxicology	Wang Y. et al.	2013	Joint Toxicity of Arsenic, Glyphosate and Dichlorvos to C. elegans.	Asian Journal of Ecotoxicology (2013), Vol. 8, No. 2, pp. 262-267	Mixture study with aresenic.
1059	Ecotoxicology	Wang Y. et al.	2014	Toxicological effects of glyphosate to Pyramidomonas delicatula and Alexandrium tamarense in water environment	Nongyao (2014), Vol. 53, No. 1, pp. 45-48	End-points are not relatable to an EU level Annex I ecotoxicology risk assessment.
1060	Ecotoxicology	Wang Y. et al.	2012	Acute Toxicity of Twenty-Two Commonly Used Herbicides to Earthworm (Eisenia fetida).	Asian Journal of Ecotoxicology (2012), Vol. 7, No. 3, pp. 317-325	The achieved acute endpoints are not considered relevant to an EU level ecotoxicology risk assessment for renewal purposes.
1061	Ecotoxicology	Watts C. et al.	2016	Responses of invertebrates to herbicide in Salix cinerea invaded wetlands: Restoration implications	Ecological management & restoration (2016), Vol. 17, No. 3, pp. 243-249	Non-EU monitoring study. Extrapolation to EU is difficult.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1062	Ecotoxicology	Webster T. M. U. et al.	2015	Global transcriptomic profiling demonstrates induction of oxidative stress and of compensatory cellular stress responses in brown trout exposed to glyphosate and Roundup.	BMC Genomics (2015), Vol. 16, No. 32	No data relevant to the EU data requirements is presented and therefore does not support the EU level renewal of glyphosate.
1063	Ecotoxicology	Wech J. et al.	2018	The effect of willow control using a glyphosate formulation on aquatic invertebrates within a New Zealand wetland	New Zealand journal of marine and freshwater research (2018), Vol. 52, No. 1, pp. 16-41	Multi-year environmental monitoring project conducted in New Zealand. Not relatable to EU level risk assessment.
1064	Ecotoxicology	Weeks Santos S. et al.	2019	A glyphosate-based herbicide induces sub-lethal effects in early life stages and liver cell line of rainbow trout, Oncorhynchus mykiss.	Aquatic toxicology (2019), Vol. 216, pp. 105291	Non-standard test design and results that cannot be related to an EU level risk assessment for EU renewal purposes.
1065	Ecotoxicology	Wrinn K. M. et al.	2012	Predator cues and an herbicide affect activity and emigration in an agrobiont wolf spider.	Chemosphere (2012), Vol. 87, No. 4, pp. 390-6	Discusses results of experiments conducted using a formulation of glyphosate that contains POEA. Not relevant to EU risk assessment.
1066	Ecotoxicology	Wu L. et al.	2016	Physiological effects of the herbicide glyphosate on the cyanobacterium Microcystis aeruginosa.	Aquatic toxicology (2016), Vol. 178, pp. 72-9	End-points presented cannot be used in the EU level renewal risk assessment for glyphosate from an ecotoxicology perspective.
1067	Ecotoxicology	Yadav S. S. et al.	2013	Toxic and genotoxic effects of Roundup on tadpoles of the Indian skittering frog (Euflictis cyanophlyctis) in the presence and absence of predator stress.	Aquatic toxicology (2013), Vol. 132-133, pp. 1-8	The Roundup formulation tested contains POEA, therefore not relevant to the EU level Annex I renewal from an ecotoxicology perspective.
1068	Ecotoxicology	Yang Z. et al.	2018	Toxic effects of four commonly-used agrochemicals on Arma chinensis and Picromerus lewisi.	Agricultural Biotechnology (2018), Vol. 7, No. 5, pp. 153-155, 158	Test item is a glyphosate formulation that is not the representative fornmulation for the Annex I renewal.
1069	Ecotoxicology	Ye J. et al.	2019	The Growth, Apoptosis and Oxidative Stress in Microcystis viridis Exposed to Glyphosate.	Bulletin of environmental contamination and toxicology (2019), Vol. 103, No. 4, pp. 585-589	Achieved end-points are not releatable to an EU level ecotoxicology assessment for Annex I renewal.
1070	Ecotoxicology	Yousaf S. et al.	2013	Effect of Pesticides on the Soil Microbial Activity.	Pakistan Journal of Zoology 2013), Vol. 45, No. 4, pp. 1063-1067	Achieved end-points are not relevant to an EU level risk assessment. Novel test design with no positive control and cannot confirm dose.
1071	Ecotoxicology	Zabaloy M. C. et al.	2016	Soil ecotoxicity assessment of glyphosate use under field conditions: microbial activity and community structure of Eubacteria and ammonia-oxidising bacteria.	Pest management science (2016), Vol. 72, No. 4, pp. 684-91	Findings are not relateable to an EU level ecotoxicology risk assessment for Annex I renewal purposes.
1072	Ecotoxicology	Zabotkina E. A. et al.	2016	The changes of the immunocompetent cells ultrastructure in the kidney, spleen and liver in Amur sleeper Perccottus glenii at the influence of pesticide Roundup.	Trudy VNIRO (2016), Vol. 162, pp. 73-81	Article cannot be related to an EU level ecotoxicology risk assessment, as exposure levels cannot be confirmed and there are no end-points presented that could be used in an ecotoxicology assessment. The paper describes sub-lethal effects / morphological changes in the structure of mitochondria.
1073	Ecotoxicology	Zain N. M. M. et al.	2013	Growth-inhibitory Effects of Herbicides on Soil Bacterial Population in Oil Palm Plantation	Journal of Pure and Applied Microbiology (2013), Vol. 7, No. 3, pp. 1799-1808	Paper describes mixture toxicity on soil communities of four pesticides, therefore not relevant to single active substance formulation for EU renewal. onto Annex i

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1074	Ecotoxicology	Zaller J. G. et al.	2018	Herbicides in vineyards reduce grapevine root mycorrhization and alter soil microorganisms and the nutrient composition in grapevine roots, leaves, xylem sap and grape juice.	Environmental science and pollution research international (2018), Vol. 25, No. 23, pp. 23215-23226	Study conducted using a formulation that is not the representative formulation for the Annex I renewal.
1075	Ecotoxicology	Zaller J. G. et al.	2014	Glyphosate herbicide affects belowground interactions between earthworms and symbiotic mycorrhizal fungi in a model ecosystem.	Scientific reports (2014), Vol. 4, pp. 5634	Formulation used was Roundup which contains POEA, the latter that is not relevant in the EU.
1076	Ecotoxicology	Zantedeschi R. et al.	2018	Selectivity of pesticides registered for soybean crop on Telenomus podisi and Trissolcus basalis.	Pesquisa Agropecuaria Tropical (2018), Vol. 48, No. 1, pp. 52-58	Test substance identity and level of exposure cannot be confirmed by the details presented in the paper.
1077	Ecotoxicology	Zebral Y. D. et al.	2018	A glyphosate-based herbicide reduces fertility, embryonic upper thermal tolerance and alters embryonic diapause of the threatened annual fish Austrolebias nigrofasciatus.	Chemosphere (2018), Vol. 196, pp. 260-269	The paper relates to the product Transorb R and not the representative formulation for the Annex I renewal. The presented data are not considered relevant for use in risk assessment as they are single rates and not derived end-points.
1078	Ecotoxicology	Zhang M. et al.	2018	Effects of nitrification inhibitor and herbicides on nitrification, nitrite and nitrate consumptions and nitrous oxide emission in an Australian sugarcane soil	Biology and fertility of soils (2018), Vol. 54, No. 6, pp. 697-706	The paper describes the influence of a nitrification inhibitor on soil functional process when exposed to herbicides. This is a comparative assessment study that is difflcut to relate to an Annex I ecotoxicology risk assessment.
1079	Ecotoxicology	Zhang Q. et al.	2016	Effects of glyphosate at environmentally relevant concentrations on the growth of and microcystin production by Microcystis aeruginosa.	Environmental monitoring and assessment (2016), Vol. 188, No. 11, pp. 632	This study presents cellular and molecular findings that are not relatable to the EU level ecotoxicology risk assessment for Annex I renewal.
1080	Ecotoxicology	Zhang Q. et al.	2015	Effects of glyphosate on Microcystis aeruginosa growth and related mechanisms	Anhui Nongye Kexue (2015), Vol. 43, No. 36, pp. 157-159	There are no end-points presented that could be used in an EU level ecotoxicology risk assessment.
1081	Ecotoxicology	Zhang Z. et al.	2016	Acute toxicity and risk assessment of paraquat aqueous solution and its 9 alternative products to Bombyx mori	Canye Kexue (2016), Vol. 42, No. 3, pp. 483-487	The dipping technique for leaf exposure is not a recognized EU approach for toxicity testing. Not relevant to an EU level Annex I ecotoxicology risk assessment.
1082	Ecotoxicology	Zhao J. et al.	2013	Non-target effects of herbicides on soil nematode assemblages	Pest Management Science (2013), Vol. 69, No. 6, pp. 679-684	Paper discusses a soil nematode meta-analysis with no supported data presented. The resulting analysis cannot be related to an EU level Annex I risk assessment.
1083	Ecotoxicology	Zhelezova A. D. et al.	2018	STRUCTURAL AND FUNCTIONAL CHARACTERISTICS OF PROKARYOTIC COMPLEX OF SOD-PODZOLIC SOIL INFLUENCED BY HERBICIDE GLYPHOSATE	Vestnik Moskovskogo Universiteta Seriya 17 Pochvovedenie (2018), No. 2, pp. 48-54	This is a medium to long term soil bacteria monitoring study. There are no quantifiable end-points presented nor exposure levels defined that can be related to an EU level ecotoxicology risk assessment for renewal purposes. Despite glyphosate being mentioned in the title / abstract, there is no information about glyphosate (rates used / source / purity etc.) in the paper.

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1084	Ecotoxicology	Zhong G. et al.	2018	Responses of Hydrilla verticillata (L.f.) Royle and Vallisneria natans (Lour.) hara to glyphosate exposure	Chemosphere (2018), Vol. 193, pp. 385-393	The paper describes enzymatic levels in aquatic plants that cannot be related to an EU level risk assessment for EU renewal.
1085	Ecotoxicology	Zhou C. et al.	2014	Inhibition effect of glyphosate on the acute and subacute toxicity of cadmium to earthworm Eisenia fetida.	Environmental toxicology and chemistry (2014), Vol. 33, No. 10, pp. 2351-7	This paper looked at the impact of GBH in combination with cadmium in soil on earthworm toxicity. This study was a mixture assessment and thus not considered relevant for the Annex I renewal of a single a.i. containing the representative formulation for Annex I renewal.
1086	Ecotoxicology	Zhou C. et al.	2012	Does glyphosate impact on Cu uptake by, and toxicity to, the earthworm Eisenia fetida?.	Ecotoxicology (2012), Vol. 21, No. 8, pp. 2297-305	This paper looked at the impact of GBH in combination with copper in soil on earthworm toxicity. This study was a mixture assessment and thus not considered relevant for the Annex I renewal of a single a.i. containing the representative formulation for Annex I renewal.
1087	Ecotoxicology	Zhu X. et al.	2016	Herbicides interfere with antigrazer defenses in Scenedesmus obliquus.	Chemosphere (2016), Vol. 162, pp. 243-51	This paper discusses sub-lethal impacts of glyphosate on colonising activity of scenedesmus. The end-points are not releatable to the EU level ecotoxicology risk assessment for Annex I renewal.
1088	Ecotoxicology	Zhu Y. C. et al.	2017	Feeding toxicity and impact of imidacloprid formulation and mixtures with six representative pesticides at residue concentrations on honey bee physiology (Apis mellifera).	PloS one (2017), Vol. 12, No. 6, pp. e0178421	This study summarises that there were no effects on bees from glyphosate exposure alone. When mixed with other pestcides, effects observed, but as this is based on mixtures, it is not relevant to EU level ecotoxicology risk assessment for single active containing formulation for Annex I renewal in the EU.
1089	Fate and behaviour in the environment	Adelowo F. E. et al.	2014	Biodegradation of Glyphosate by Fungi Species	Advances in Bioscience and Bioengineering (2014), Vol. 2, No. 1, pp. 104	Degradation of glyphosate by fungal isolates from Nigerian soil not relevant to EU risk assessment.
1090	Fate and behaviour in the environment	Ahmed S. et al.	2011	Influence of parameters on the heterogeneous photocatalytic degradation of pesticides and phenolic contaminants in wastewater: A short review.	Journal of Environmental Management (2011), Vol. 92, No. 3, pp. 311-330	This paper is a literature review withno experimental data provided. Investigation of specific methods of wastewater treatment are also not relevant to the data requirements
1091	Fate and behaviour in the environment	Allinson G. et al.	2016	Pesticide and trace metals in surface waters and sediments of rivers entering the Corner Inlet Marine National Park, Victoria, Australia.	Environmental science and pollution research international (2016), Vol. 23, No. 6, pp. 5881-91	No glyphosate analysis included in paper.
1092	Fate and behaviour in the environment	Alza-Camacho W. R. et al.	2016	Voltammetric quantification of Paraquat and glyphosate in surface waters. Determinacion voltametrica de paraquat y glifosato en aguas superficiales.	Revista Corpoica - Ciencia y Tecnologia Agropecuarias (2016), Vol. 17, No. 3, pp. 331-345	Primarily a methods paper. Includes analysis of 10 water samples from Colombia but only minimal details on collection of samples provided.
1093	Fate and behaviour in the environment	Anon.	2016	Reply to: Comments on the paper: Re-evaluation of groundwater monitoring data for glyphosate and bentazone by taking detection limits into account	Science of the Total Environment (2016), Vol. 557-558, pp. 916	No new data presented, just discussion of statistical methods for re-evaluation.

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1094	Fate and behaviour in the environment	Aparicio V. C. et al.	2013	Environmental fate of glyphosate and aminomethylphosphonic acid in surface waters and soil of agricultural basins.	Chemosphere (2013), Vol. 93, No. 9, pp. 1866-73	Analysis of soil and surface water samples related to cultivation of transgenic crops in Argentina are not representative for European agricultural practice.
1095	Fate and behaviour in the environment	Arroyave J. M. et al.	2017	Desorption rate of glyphosate from goethite as affected by different entering ligands: hints on the desorption mechanism.	Environmental Chemistry (2017), Vol. 14, No. 5, pp. 288-294	Desorption of glyphosate from geothite is studied relative to other competing ligands. Provides useful information on glyphosate desorption factors but not relevant to risk assessment.
1096	Fate and behaviour in the environment	Babic S. et al.	2018	Assessment of river sediment toxicity: Combining empirical zebrafish embryotoxicity testing with in silico toxicity characterization.	The Science of the total environment (2018), Vol. 643, pp. 435-450	Toxicity of sediments containing mixtures of chemicals are discussed.
1097	Fate and behaviour in the environment	Baez M. E. et al.	2015	Sorption-desorption behavior of pesticides and their degradation products in volcanic and nonvolcanic soils: interpretation of interactions through two-way principal component analysis	Environmental science and pollution research international (2015), Vol. 22, No. 11, pp. 8576-85	Adsorption/ desorption studies done on a mixture of glyphosate and AMPA. Not relevant for EU risk assessment.
1098	Fate and behaviour in the environment	Baez M. E. et al.	2014	Determination of glyphosate and aminomethylphosphonic acid in aqueous soil matrices: a critical analysis of the 9-fluorenylmethyl chloroformate derivatization reaction and application to adsorption studies.	Journal of separation science (2014), Vol. 37, No. 21, pp. 3125-32	Adsorption/ desorption studies done on a mixture of glyphosate and AMPA. Not relevant for EU risk assessment.
1099	Fate and behaviour in the environment	Battaglin W. A. et al.	2014	Glyphosate and its degradation product AMPA occur frequently and widely in U.S. soils, surface water, groundwater, and precipitation. Special Issue: Contaminants of emerging concern II.	Journal of the American Water Resources Association (2014), Vol. 50, No. 2, pp. 275-290	Analysis of soil, groundwater, surface water and sediment samples from USA are not representative for European agricultrual practice.
1100	Fate and behaviour in the environment	Bento C. P. M. et al.	2018	Spatial glyphosate and AMPA redistribution on the soil surface driven by sediment transport processes - A flume experiment	Environmental pollution (2018), Vol. 234, pp. 1011-1020	Artificial run-off situation not relevant for risk assessment.
1101	Fate and behaviour in the environment	Berzins A. et al.	2019	Modeling the mobility of glyphosate from two contrasting agricultural soils in laboratory column experiments	Journal of Environmental Science and Health, Part B: Pesticides, Food Contaminants, and Agricultural Wastes (2019), Vol. 54, No. 7, pp. 539-548	Study of glyphosate degradation in Latvian sandy and loamy sand soils +/- augmentation with endophytic bacteria and fungi isolated from oilseed rape and barley followed by column leaching of same soils. Method not relevant for EU risk assessment.
1102	Fate and behaviour in the environment	Bois P. et al.	2013	Herbicide mitigation in microcosms simulating stormwater basins subject to polluted water inputs.	Water research (2013), Vol. 47, No. 3, pp. 1123-35	Glyphosate concentrations in the microcosm system were 1000-fold higher than typical concentrations. Glyphosate degradation results not relevant for risk assessment.

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1103	Fate and behaviour in the environment	Bois P. et al.	2011	Herbicide degradation and copper complexation by bacterial mixed cultures from a vineyard stormwater basin.	Journal of Soils and Sediments (2011), Vol. 11, No. 5, pp. 860-873	Cultivation and analysis of bacterial communities as well as analysis of glyphosate in the respective culture supernatants are not relevant to the data requirements.
1104	Fate and behaviour in the environment	Bonansea R. I. et al.	2018	The Fate of Glyphosate and AMPA in a Freshwater Endorheic Basin: An Ecotoxicological Risk Assessment.	Toxics (2017), Vol. 6, No. 3, pp. 1	Paper reports concentrations of glyphosate & AMPA in water, sediment and suspended particulate matter in a river in Argentina. No information on product use provided. Not relevant to EU risk assessment.
1105	Fate and behaviour in the environment	Bonfleur E. J. et al.	2011	Mineralization and degradation of glyphosate and atrazine applied in combination in a Brazilian Oxisol.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2011), Vol. 46, No. 1, pp. 69-75	Laboratory soil degradation experiments with Brazilian soils are not representative for European conditions.
1106	Fate and behaviour in the environment	Botero-Coy A. M. et al.	2013	Improvements in the analytical methodology for the residue determination of the herbicide glyphosate in soils by liquid chromatography coupled to mass spectrometry.	Journal of chromatography. A (2013), Vol. 1292, pp. 132-41	Primarily a methods paper. Includes analysis of 26 soil samples from Colombia and Argentina but no details on source or collection of samples provided.
1107	Fate and behaviour in the environment	Boz B. et al.	2015	Analysis of suspended solids and Glyphosate and efficacy of the cross-compliance standard 5.2 'buffer strips' in the protection of superficial water from suspended solids in runoff conveyed through a vineyard. Special Issue: Cross compliance. Results of t	Italian Journal of Agronomy (2015), Vol. 10, No. s1, 701 p	The effectiveness of vegetated buffer to prevent glyphosate run-off events was investigated but the concentration of glyphosate from the vineyard runoff were all below the detection limit therefore it was not possible to evaluate the efficiency of the buffer zone in removing glyphosate.
1108	Fate and behaviour in the environment	Bradley P. M. et al.	2018	Reconnaissance of Mixed Organic and Inorganic Chemicals in Private and Public Supply Tapwaters at Selected Residential and Workplace Sites in the United States.	Environmental Science and Technology (2018), Vol. 52, No. 23, pp. 13972-13985	Paper describes analysis of glyphosate and AMPA in tapwater from multiple sampling sites in the U.S. Glyphosate and AMPA were not reported to have been found in any samples. Not relevant to EU risk assessment.
1109	Fate and behaviour in the environment	Caceres-Jensen L. et al.	2019	Electrochemical method to study the environmental behavior of Glyphosate on volcanic soils: Proposal of adsorption-desorption and transport mechanisms.	Journal of hazardous materials (2019), Vol. 379, pp. 120746	Adsorption /Desorption studies did not follow OECD guideline. Solutions did not contain CaCl2.
1110	Fate and behaviour in the environment	Cao L. et al.	2014	Determination of Herbicides and Its Metabolite in Soil and Water Samples by Capillary Electrophoresis-laser Induced Fluorescence Detection Using Microwave-assisted Derivatization	Analytical Sciences (2014), Vol. 30, No. 7, pp. 759	Analytical method paper, testing fortified environmental samples only to demonstrate method.
1111	Fate and behaviour in the environment	Choubert J. M. et al.	2011	Limiting the emissions of micro-pollutants- what efficiency can we expect from wastewater treatment plants?	Water Science and Technology (2011), Vol. 63, No. 1, pp. 57-65	No specific analysis results for glyphosate or AMPA reported. Investigation of the removal efficiencies of different treatment processes of wastewater treatment plants are not relevant to the data requirements.

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1112	Fate and behaviour in the environment	Chretien F. et al.	2017	Surface runoff and subsurface tile drain losses of neonicotinoids and companion herbicides at edge-of-field.	Environmental pollution (2017), Vol. 224, pp. 255-264	Concentration measurements in run-off and drainage water from fields cultivated with corn and soybean in Canada are not representative for European agricultural practice.
1113	Fate and behaviour in the environment	Clua A. et al.	2012	The effects of glyphosate on the growth of birdsfoot trefoil (Lotus corniculatus) and its interaction with different phosphorus contents in soil.	Journal of Agricultural Science (2012), Vol. 4, No. 7, pp. 208-218	No analysis of glyphosate or its metabolites. Outdoor study conducted in Argentina, hence conditions are not representative for Europe.
1114	Fate and behaviour in the environment	Danial R. et al.	2019	FTIR, CHNS and XRD analyses define mechanism of glyphosate herbicide removal by electrocoagulation.	Chemosphere (2019), Vol. 233, pp. 559-569	Theoretical beaker scale test for removing glyphosate from water. Natural water was not used. Not relevant for EU risk assessment.
1115	Fate and behaviour in the environment	Daouk S. et al.	2015	Fluorescence spectroscopy to study dissolved organic matter interactions with agrochemicals applied in Swiss vineyards.	Environmental science and pollution research international (2015), Vol. 22, No. 12, pp. 9284-92	No new data on glyphosate are presented. The article focuses on analysis of dissolved organic matter in soil water samples and correlates them with glyphosate concentrations determined in another study (Daouk, 2013).
1116	Fate and behaviour in the environment	Degenhardt D. et al.	2012	Dissipation of glyphosate and aminomethylphosphonic acid in water and sediment of two Canadian prairie wetlands.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2012), Vol. 47, No. 7, pp. 631-9	Field trials in Canadian prairie wetlands are not representative for European agricultural practice.
1117	Fate and behaviour in the environment	Delmonico E. L. et al.	2014	Determination of glyphosate and aminomethylphosphonic acid for assessing the quality tap water using SPE and HPLC.	Acta Scientiarum Technology (2014), Vol. 36, No. 3, pp. 513-519	Development of glyphosate analytical method and demonstration of the method through analysis of public water supply samples from Brazil. Not relevant to EU risk assessment.
1118	Fate and behaviour in the environment	dos Santos S. C. et al.	2014	Development of electroanalytical methodology for determination of pesticide glyphosate in environmental samples	Revista Virtual de Quimica (2014), Vol. 6, No. 4, pp. 866-883	Mainly analytical method. Only one natural sample collected and analyzed to demonstrate method.
1119	Fate and behaviour in the environment	Erban T. et al.	2018	The different behaviors of glyphosate and AMPA in compost-amended soil	Chemosphere (2018), Vol. 207, pp. 78-83	Effect of compost amendment on dissipation of glyphosate and AMPA in Czech soil after multiple glyphosate applications. Not relevant to EU risk assessment.
1120	Fate and behaviour in the environment	Ermakova I. T. et al.	2010	Bioremediation of glyphosate-contaminated soils.	Applied microbiology and biotechnology (2010), Vol. 88, No. 2, pp. 585-94	Biodegradation by selected bacterial strains in open microcosms and field plots in Russia are not relevant to the data requirement and not representative for European conditions
1121	Fate and behaviour in the environment	Farenhorst A. et al.	2015	Bulk deposition of pesticides in a Canadian city: Part 1. Glyphosate and other agricultural pesticides.	Water, Air, and Soil Pollution (2015), Vol. 226, No. 3, 47 p	Analysis of urban dust deposition samples from agricultural areas in Winnipag, Canada are not representative for European agricultural practice
1122	Fate and behaviour in the environment	Faria R. R. et al.	2019	Parameters for glyphosate in OPLS-AA force field	Molecular Simulation (2019), 45(1), 80-85	Mechanism of action study not relevant to EU risk assessment. Use of molecular dynamics (MD) simulations to provide an atomistic detail in the description of such a system. Herein, partial atomic charges and dihedral angles were obtained quantum mechanism for glyphosate molecule. Parameters for MD simulation were implemented in the OPLS-AA force field to

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
						better understand the herbicide mechanism action. Results showed that atomic charges were consistent with the database of the force field. Additionally., potential energy curves for the dihedrals were consistent and could be used to run MD simulations. Therefore, the parameterisation reported for this molecule can be useful to explain studies involving its interaction with many enzymes and proteins such as 5-enolpyruvylshikimate 3-phosphate synthase enzyme (EPSP). Furthermore, considering these new data in OPLS-AA, numerous simulations can be proposed to unveil the effects of the glyphosate as an environment contaminant.
1123	Fate and behaviour in the environment	Ferrario C. et al.	2017	Legacy and emerging contaminants in meltwater of three Alpine glaciers	Science of the Total Environment (2017), Vol. 574, pp. 350-357	The paper is about contaminants in meltwater of Alpine glaciers, no glyphosate or AMPA were measured.
1124	Fate and behaviour in the environment	Gasperi J. et al.	2010	Occurrence and removal of priority pollutants by lamella clarification and biofiltration	Water Research (2010), Vol. 44, No. 10, pp. 3065-3076	Experiments on wastewater treatment are not relevant to EU data requirements.
1125	Fate and behaviour in the environment	Giaccio G. C. M. et al.	2019	Glyphosate and nutrient retention in preferential flow pathways	Ecologia Austral (2019), Vol. 29, No. 3, pp. 329-338	Study of vegetative strips in Argentina, not relevant to EU.
1126	Fate and behaviour in the environment	Ginebreda A. et al.	2018	Reconciling monitoring and modeling: An appraisal of river monitoring networks based on a spatial autocorrelation approach - emerging pollutants in the Danube River as a case study	Science of the Total Environment (2018), Vol. 618, pp. 323-335	Relevant for Water Framework Directive but not pesticide registration. The results of this study show how auto-correlation models can aid water managers to improve the design of river monitoring networks. Not relevant for EU Risk Assessment.
1127	Fate and behaviour in the environment	Gloria O. N. et al.	2010	In vitro effects of four heavy metals on glyphosate utilization by some bacteria isolated from rice fields.	African Journal of Microbiology Research (2010), Vol. 4, No. 16, pp. 1775-1783	Experiments on the influence of heavy metals on the growth of isolated bacteria in the presence of glyphosate are not relevant to the data requirements.
1128	Fate and behaviour in the environment	Gomes M. P. et al.	2015	Consequences of phosphate application on glyphosate uptake by roots: Impacts for environmental management practices.	The Science of the total environment (2015), Vol. 537, pp. 115-9	Analysis of glyphosate in roots and leaves of hydroponically cultivated willow plants are not relevant to the data requirements.
1129	Fate and behaviour in the environment	Gurson A. P. et al.	2019	Mobility of 2,4-Dichlorophenoxyacetic Acid, Glyphosate, and Metribuzine Herbicides in Terra Rossa-Amended Soil: Multiple Approaches with Experimental and Mathematical Modeling Studies.	Water Air and Soil Pollution (2019), Vol. 230, No. 9, pp. Article No.: 220	Soil used for A/D and mobility testing is not a natural soil but rather a soil mixture. Not relevant for EU risk assessment.

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1130	Fate and behaviour in the environment	Gustavsson M. et al.	2017	Pesticide mixtures in the Swedish streams: Environmental risks, contributions of individual compounds and consequences of single-substance oriented risk mitigation	Science of the Total Environment (2017), Vol. 598, pp. 973-983	No glyphosate data presented.
1131	Fate and behaviour in the environment	Hansen C. T. et al.	2015	Re-evaluation of groundwater monitoring data for glyphosate and bentazone by taking detection limits into account.	The Science of the total environment (2015), Vol. 536, pp. 68-71	No new data presented, only discussion of statistical methods to re-evaluation.
1132	Fate and behaviour in the environment	Hedegaard M. J. et al.	2017	Microbial pesticide removal in rapid sand filters for drinking water treatment - Potential and kinetics (vol 48, pg 71, 2014).	Water Research (2017), Vol. 122, pp. 708-713	Erratum to Hedegaard et al. 2014; does not contain any data for glyphosate.
1133	Fate and behaviour in the environment	Henault-Ethier L. et al.	2017	Herbaceous or Salix miyabeana 'SX64' narrow buffer strips as a means to minimize glyphosate and aminomethylphosphonic acid leaching from row crop fields.	Science of the total environment (2017), pp. 1177-1186	Field trials in Canada with glyphosate resistant crops and Salix miyabeana buffer strips are not relevant to the data requirement and not representative to European agricultural practice
1134	Fate and behaviour in the environment	Herath G. A. D. et al.	2019	Statistical optimization of glyphosate adsorption by biochar and activated carbon with response surface methodology.	Chemosphere (2019), Vol. 227, pp. 533-540	Test tube optimization of glyphosate adsorption using biochar and activated carbon. Not relevant for commercial application. Not relevant for EU risk assessment.
1135	Fate and behaviour in the environment	Herrman K. S. et al.	2012	Nutrient Loss Following Phragmites australis Removal in Controlled Soil Mesocosms	Water, air and soil pollution (2012), Vol. 223, No. 6, pp. 3333-3344	No analysis of glyphosate or its metabolites.
1136	Fate and behaviour in the environment	Hosseini N. et al.	2019	Removal of 2,4-D, glyphosate, trifluralin, and butachlor herbicides from water by polysulfone membranes mixed by graphene oxide/TiO2 nanocomposite: study of filtration and batch adsorption	JOURNAL OF ENVIRONMENTAL HEALTH SCIENCE AND ENGINEERING (2019), Vol. 17, No. 1, pp. 247-258	Testing of new synthetic membranes for glyphosate adsorption/ rejection at lab scale not relevant for EU risk assessment.
1137	Fate and behaviour in the environment	Hu Y. S. et al.	2011	Removal of glyphosate from aqueous environment by adsorption using water industrial residual	Desalination (2011), Vol. 271, No. 1-3, pp. 150-156	Experiments on glyphosate adsorption to residual alum sludge from water treatment plants are not relevant to the data requirements.
1138	Fate and behaviour in the environment	Jarvis N.	2018	Meta-analysis of pesticide sorption in subsoil	Environmental Toxicology and Chemistry (2018), Vol. 37, No. 3, pp. 755-761	Comparison of the Koc model vs the power law model to characterize adsorption in sub-soils. While glyphosate existing data is considered, the approach is not relevant to EU risk assessment.
1139	Fate and behaviour in the environment	Johnsen A. R. et al.	2016	Comments on the article: Re-evaluation of groundwater monitoring data for glyphosate and bentazone by taking detection limits into account	Science of the Total Environment (2016), Vol. 557-558, pp. 914-915	No new data presented, only disussion of statistical methods for re-evaluation.

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1140	Fate and behaviour in the environment	Junges C. M. et al.	2013	Effectiveness evaluation of glyphosate oxidation employing the H(2)O(2)/UVC process: toxicity assays with Vibrio fischeri and Rhinella arenarum tadpoles.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2013), Vol. 48, No. 3, pp. 163-70	No relevant information on environmental fate included. Paper is about removal of glyphosate from wastewater polluted by commercial formulations of glyphosate
1141	Fate and behaviour in the environment	Kaur S. et al.	2017	Pesticides Curbing Soil Fertility: Effect of Complexation of Free Metal Ions	FRONTIERS IN CHEMISTRY (2017), Vol. 5, Article 43, pp. 1	Experiments on reaction of pesticides with isolated metal salts are not relevant to EU data requirements.
1142	Fate and behaviour in the environment	Keesstra S. D. et al.	2019	Straw mulch as a sustainable solution to decrease runoff and erosion in glyphosate-treated clementine plantations in Eastern Spain. An assessment using rainfall simulation experiments	Catena (2019), Vol. 174, pp. 95-103	No measurement of glyphosate in this article. Glyphosate only used for weed control.
1143	Fate and behaviour in the environment	Knerr H. et al.	2015	Micropollutants from WWTPs in Rheinland-Palatinate	Wasser und Abfall (2015), Vol. 17, No. 1/2, pp. 23-28	Does not present any numerical measurement data. Discusses evaluation of occurrence and levels of micropollutants at waste water treatment plants of rural and urban geopgraphies.
1144	Fate and behaviour in the environment	Lashermes G. et al.	2010	Sorption and mineralization of organic pollutants during different stages of composting.	Chemosphere (2010), Vol. 79, No. 4, pp. 455-62	Sorption and mineralization in artificial lab compost mixtures are not relevant to the data requirement.
1145	Fate and behaviour in the environment	Linklater N. et al.	2013	Real-Time and Near Real-Time Monitoring Options for Water Quality.	Ahuja, S. (2013) pp. 189-225, Monitoring Water Quality: Pollution Assessment, Analysis, and Remediation, Monitoring Water Quality: Pollution Assessment, Analysis, and Remediation, Publisher: ELSEVIER SCIENCE BV, ISBN: 978-0-444-59395-5(H), 978-0-444-59404-4(P)	No specific monitoring data for glyphosate or AMPA is reported (a book chapter).
1146	Fate and behaviour in the environment	Lucadamo L. et al.	2018	Evaluation of glyphosate drift and anthropogenic atmospheric trace elements contamination by means of lichen transplants in a southern Italian agricultural district.	Air Quality Atmosphere and Health (2018), Vol. 11, No. 3, pp. 325-339	Atmospheric contamination due to glyphosate and trace elements were monitored in a southern Italian agricultural district by means of transplanted thalli of the lichen Pseudevernia furfuracea. An unusual technique which provides information on atmospheric dispersion of glyphosate but not relevant to risk assessment.
1147	Fate and behaviour in the environment	Lupi L. et al.	2015	Occurrence of glyphosate and AMPA in an agricultural watershed from the southeastern region of Argentina.	The Science of the total environment (2015), Vol. 536, pp. 687-694	Analysis of soil, water and sediment samples from agricultural areas in Argentina cultivated with soybean are not representative for European agricultural practice.
1148	Fate and behaviour in the environment	Lupi L. et al.	2019	Glyphosate runoff and its occurrence in rainwater and subsurface soil in the nearby area of agricultural fields in Argentina.	Chemosphere (2019), Vol. 225, pp. 906-914	Glyphosate measurements in rainfall in Brazil not relevant for EU risk assessment. Soil column leaching experiment on an Argentinian soil in which the control also contains glyphosate, and is not relevant to EU risk assessment.

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1149	Fate and behaviour in the environment	Magga Z. et al.	2012	Combining experimental techniques with non-linear numerical models to assess the sorption of pesticides on soils.	Journal of contaminant hydrology (2012), Vol. 129-130, pp. 62-9	The article describes batch experiments to derive equilibrium and non–equilibrium sorption parameters for glyphosate. However, the current guideline (OECD 106) for those experiments was not followed (use of triple distilled water instead of CaCl2, only liquid phase analyzed but stability of test item not shown, test concentrations not reported). Further, continuous flow soil column experiments were conducted with synthetic groundwater. This experiment is not relevant according to the data requirements.
1150	Fate and behaviour in the environment	Majewski M. S. et al.	2014	Pesticides in Mississippi air and rain: a comparison between 1995 and 2007.	Environmental toxicology and chemistry (2014), Vol. 33, No. 6, pp. 1283-93	Analysis of air and rainfall samples from agricultural areas in Mississippi (USA) cultivated with soybean are not representative for European agricultural practice.
1151	Fate and behaviour in the environment	Malviya B. J. et al.	2015	Bioremediation of Glyphosate by Bacteria Isolated from Glyphosate Contaminated Soil.	Journal of Pure and Applied Microbiology (2015), Vol. 9, No. 4, pp. 3315-3319	Study of bacterial isolates from area of glyphosate production plant in India for ability to degrade glyphosate as a sole carbon source. Not relevant to EU risk assessment.
1152	Fate and behaviour in the environment	Mamy L. et al.	2010	Comparative environmental impacts of glyphosate and conventional herbicides when used with glyphosate-tolerant and non-tolerant crops.	Environmental pollution (2010), Vol. 158, No. 10, pp. 3172-8	Modelling approach on balances and overall toxicity potential; no new environmental fate data generated.
1153	Fate and behaviour in the environment	Mamy L. et al.	2016	Glyphosate fate in soils when arriving in plant residues.	Chemosphere (2016), Vol. 154, pp. 425-433	Laboratory experiment on oilseed rape plant residues treated with glypohosate and placed on/mixed with soil samples are not relevant to the data requirement.
1154	Fate and behaviour in the environment	Mardiana-Jansar K. et al.	2014	Residue determination and levels of glyphosate in surface waters, sediments and soils associated with oil palm plantation in Tasik Chini, Pahang, Malaysia	AIP Conference Proceedings (2014), 1614 (1, 2014 UKM FST Postgraduate Colloquium), pp. 795-802	Field trials in oil palm plantation in Malaysia are not representative for European agricultural practice.
1155	Fate and behaviour in the environment	Mattos R. et al.	2017	Quantitation and Adsorption of Glyphosate Using Various Treated Clay	Zeitschrift fuer Physikalische Chemie (2017), Vol. 231, No. 11-12, pp. 1815-1829	Adsorption studies for glyphosate conducted with clay chemically modified with metals. Not relevant to natural soils.
1156	Fate and behaviour in the environment	Mauffrey F. et al.	2017	Bacterial Community Composition and Genes for Herbicide Degradation in a Stormwater Wetland Collecting Herbicide Runoff	Water, air, and soil pollution (2017), Vol. 228, No. 12, 452 p	Investigation of bacterial community composition and genetic analyses not relevant to EU data requirements.
1157	Fate and behaviour in the environment	Mazzei P. et al.	2012	Quantitative evaluation of noncovalent interactions between glyphosate and dissolved humic substances by NMR spectroscopy.	Environmental science & technology (2012), Vol. 46, No. 11, pp. 5939-46	Experiments on reaction of glyphosate with isolated humic and fulvic acids are not related to the data requirements.

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1158	Fate and behaviour in the environment	McMurry S. T. et al.	2016	Land use effects on pesticides in sediments of prairie pothole wetlands in North and South Dakota.	The Science of the total environment (2016), Vol. 565, pp. 682-689	Analysis of wetland sediment samples from prairie pothole wetlands in North and South Dakota (USA) are not representative for European conditions and agricultural practice.
1159	Fate and behaviour in the environment	Mendez M. J. et al.	2017	Glyphosate and Aminomethylphosphonic acid (AMPA) contents in the respirable dust emitted by an agricultural soil of the central semiarid region of Argentina	AEOLIAN RESEARCH (2017), Vol. 29, pp. 23-29	Analysis of artificially generated dust from Argentinian field locations are not relevant to the data requirements and not representative for European agricultural practice.
1160	Fate and behaviour in the environment	Mercurio P. et al.	2014	Glyphosate persistence in seawater.	Marine pollution bulletin (2014), Vol. 85, No. 2, pp. 385-90	Experiments on glyphosate degradation in seawater samples from the Great Barrier Reef (Australia) are not representative to European conditions.
1161	Fate and behaviour in the environment	Metzger S. et al.	2014	Trace substance removal in wastewater treatment plants-Experiences in Baden-Wuerttemberg	Gewaesserschutz, Wasser, Abwasser (2014), 234, 57/1-57/19	Main focus of the paper is use of activated carbon to remove contaminants. No glyphosate data presented. AMPA data presented in only one figure. Text indicates AMPA not effectively removed by amounts of activated carbon being studied. Since the AMPA is derived from other sources, relevance to glyphosate degradation cannot be established.
1162	Fate and behaviour in the environment	Minh H. D. et al.	2015	Molecularly imprinted polymer-based electrochemical sensor for the sensitive detection of glyphosate herbicide.	International Journal of Environmental Analytical Chemistry (2015), Vol. 95, No. 15, pp. 1489-1501	Analytical method. Fortified tap water samples used to demonstrate method; no real world samples analyzed.
1163	Fate and behaviour in the environment	Moneke A. N. et al.	2010	Biodegradation of glyphosate herbicide in vitro using bacterial isolates from four rice fields.	African Journal of Biotechnology (2010), Vol. 9, No. 26, pp. 4067-4074	Experiments on in-vitro biodegradation with isolated bacteria strains are not relevant to the data requirement.
1164	Fate and behaviour in the environment	Moraes P. V. D. et al.	2010	Environmental behaviour of glyphosate. Comportamento ambiental do glifosato.	Scientia Agraria Paranaensis (2010), Vol. 9, No. 3, pp. 22-35	Literature review, secondary source of information.
1165	Fate and behaviour in the environment	Mueller T. C. et al.	2015	Methods Related to Herbicide Dissipation or Degradation under Field or Laboratory Conditions.	Weed Science (2015), Vol. 63, No. Sp. Iss. 1, pp. 133-139	No measurement of glyphosate or AMPA. Glyphosate was used for weed control.
1166	Fate and behaviour in the environment	Nourouzi M. M. et al.	2012	Application of ferric chloride for removal of Glyphosate: modeling of axial and radial flow impellers using artificial neural networks.	Journal of Environmental Engineering (2012), Vol. 138, No. 11, pp. 1157-1164	Investigation of formation of insoluble ferric chloride complex is not relevant to the data requirement.
1167	Fate and behaviour in the environment	Ocenaskova V. et al.	2012	Occurrence of pesticides not regularly monitored in the hydrosphere of the Czech Republic	Vodohospodarske Technicko-Ekonomicke Informace (2012), Vol. 54, No. 6, pp. 13S-16S	No glyphosate data presented. AMPA data in only one figure. Since the AMPA is derived from other sources, relevance to glyphosate degradation cannot be established.

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1168	Fate and behaviour in the environment	de Oliveira D. A. et al.	2014	Effects of pig slurry application on soil physical and chemical properties and glyphosate mobility.	Revista Brasileira de Ciencia do Solo (2014), Vol. 38, No. 5, pp. 1421-1431	Field trials on Brazilian sub-tropical savannah sites amended with pig slurry are not relevant to the data requirements and not representative of Euuropean conditions and agricultural practice.
1169	Fate and behaviour in the environment	Oliveira Pereira E. A. et al.	2019	Determination of glyphosate and aminomethylphosphonic acid by sequential-injection reversed-phase chromatography: method improvements and application in adsorption studies.	Analytical and bioanalytical chemistry (2019), Vol. 411, No. 11, pp. 2317-2326	Analytical method and adsorption testing using a glyphosate formulation: Roundup® Original DI.
1170	Fate and behaviour in the environment	Ololade O. O. et al.	2019	Influence of electrolyte composition and pH on glyphosate sorption by cow-dung amended soil	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2019), Vol. 54, No. 9, pp. 758-769	Nigerian soil, no textural characterization of soil, non-guideline CaCl2 concentration and no basis for comparison to guideline studies.
1171	Fate and behaviour in the environment	Ololade O. O. et al.	2019	Influence of cow-dung amendment on glyphosate mobility in soil	Toxicological & Environmental Chemistry (2019), Vol. 101, No. 3-6, pp. 265-280	Adsorption/desorption of Nigerian soil and cow dung from grazing cows. Not relevant to EU risk assessment.
1172	Fate and behaviour in the environment	Orcelli T. et al.	2018	Study of Interaction Between Glyphosate and Goethite Using Several Methodologies: an Environmental Perspective	Water, air, and soil pollution (2018), Vol. 229, No. 5, 150 p	Information regarding adsorption of glyphosate onto goethite under varying pH. Not relevant to EU risk assessment.
1173	Fate and behaviour in the environment	Otalvaro J. O. et al.	2018	Interaction of pesticides with natural and synthetic solids. Evaluation in dynamic and equilibrium conditions.	Environmental science and pollution research international (2018), Vol. 25, No. 7, pp. 6707-6719	Paper includes study of binding of glyphosate to Humic acid and effect of binding on dissolution of humic acid. Not relevant since binding to soil components were studied separately and not in soil.
1174	Fate and behaviour in the environment	Padilla J. T. et al.	2018	Glyphosate transport in two Louisiana agricultural soils: miscible displacement studies and numerical modeling	Soil Systems (2018), Vol. 2, No. 3, pp. 53	Does not follow OECD column leaching or adsorption / desorption guidelines.
1175	Fate and behaviour in the environment	Padilla J. T. et al.	2019	Time-dependent sorption and desorption of glyphosate in soils: multi-reaction modeling	Vadose Zone Journal (2019), Vol. 18, No. 1, pp.	Experiments on batch adsorption and time-dependent sorption are not in line with OECD 106 guideline or guidance on aged sorption, thus not relevant to the data requirement.
1176	Fate and behaviour in the environment	Padilla-Sanchez J. A. et al.	2012	Innovative determination of polar organophosphonate pesticides based on high-resolution Orbitrap mass spectrometry.	Journal of mass spectrometry (2012), Vol. 47, No. 11, pp. 1458-65	Development and performance of a multi-component analytical method. For the analysis of agricultural soil samples, no experimental details are reported.
1177	Fate and behaviour in the environment	Penders E. J. M. et al.	2012	Genotoxic effects in the Eastern mudminnow (Umbra pygmaea) after prolonged exposure to River Rhine water, as assessed by use of the in vivo SCE and Comet assays	Environmental and Molecular Mutagenesis (2012), Vol. 53, No. 4, pp. 304-310	Toxicity of river water. No environmental data on glyphosate presented.

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1178	Fate and behaviour in the environment	Pereira E. A. O. et al.	2019	Adsorption of glyphosate on Brazilian subtropical soils rich in iron and aluminum oxides	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2019), Vol. 54, No. 11, pp. 906-914	Does not follow guideline OECD adsorption/desorption method.
1179	Fate and behaviour in the environment	Pinto E. et al.	2018	Quantitative analysis of glyphosate, glufosinate and AMPA in irrigation water by in situ derivatization-dispersive liquid-liquid microextraction combined with UPLC-MSMS	Analytical methods (2018), Vol. 10, No. 5, pp. 554-561	Analytical method for detection of glyphosate, AMPA, glufosinate in water. Real water samples analyzed by locations not identified.
1180	Fate and behaviour in the environment	Polyakova N. N. et al.	2018	Effect of Herbicides Application on the Soil Biological Activity in the Tree Nursery.	Agrokhimiya (2018), No. 12, pp. 35-41	Non-EU studies not relevant to EU. Study of cellulose degradation in glyphosate treated soil conducted in Russia.
1181	Fate and behaviour in the environment	Prasanthi Y. et al.	2012	Glyphosate levels in soil, water and air before and after application on agricultural farms	Organohalogen Compounds (2012), Vol. 74, pp. 316-319, 4 pp.	Non-EU study. Measurement of glyphosate concentrations in soil and runoff water from university site in Kentucky, USA. Not relevant for EU risk assessment.
1182	Fate and behaviour in the environment	Qin J. et al.	2013	Can rainwater induce Fenton-driven degradation of herbicides in natural waters?.	Chemosphere (2013), Vol. 92, No. 8, pp. 1048-52	Study not conducted in natural system. No direct relevance to risk assessment.
1183	Fate and behaviour in the environment	Ratola N. et al.	2014	Biomonitoring of pesticides by pine needles - Chemical scoring, risk of exposure, levels and trends	Science of the Total Environment (2014), Vol. 476-477, pp. 114-124	No monitoring of glyphosate in the study.
1184	Fate and behaviour in the environment	Rendon-von Osten J. et al.	2017	Glyphosate Residues in Groundwater, Drinking Water and Urine of Subsistence Farmers from Intensive Agriculture Localities: A Survey in Hopelchen, Campeche, Mexico.	International journal of environmental research and public health (2017), Vol. 14, No. 6, pp. E595	Analysis of groundwater, and drinking water samples from intensive agricultural areas in Mexico are not representative for European agricultural practice. Analysis of urine samples is not relevant to the data requirements.
1185	Fate and behaviour in the environment	Richards B. K. et al.	2012	Surveying upstate NY well water for pesticide contamination: Cayuga and Orange counties	Ground Water Monitoring & Remediation (2012), Vol. 32, No. 1, pp. 73-82	Analysis of pesticides in groundwater wells in the US not relevant to EU risk assessment. No glyphosate or AMPA measurements reported.
1186	Fate and behaviour in the environment	Romano-Armada N. et al.	2019	Construction of a combined soil quality indicator to assess the effect of glyphosate application	Science of the Total Environment (2019), Vol. 682, pp. 639-649	Soil quality assessment conducted based on Argentinian soils. Not relevant fo EU risk assessment.
1187	Fate and behaviour in the environment	Ronco A. E. et al.	2016	Water quality of the main tributaries of the Parana Basin: glyphosate and AMPA in surface water and bottom sediments	Environmental Monitoring and Assessment (2016), Vol. 188, No. 8, pp. 458	Analyses of glyphosate and AMPA water and sediment samples from Argentinian agricultural areas planted with genetically modified glyphosate-resistant crops are not representative for European agricultural practice

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1188	Fate and behaviour in the environment	Rott E. et al.	2017	Removal of phosphorus from phosphonate-loaded industrial wastewaters via precipitation/flocculation	JOURNAL OF WATER PROCESS ENGINEERING (2017), Vol. 17, pp. 188-196	No data on glyphosate or AMPA presented. Only references to journal articles before 2010.
1189	Fate and behaviour in the environment	Rudolph W.	2015	Greening conditions, glyphosate skepticism and groundwater protection: Three G-Core issues. Greeningauflagen, Glyphosatskepsis und Grundwasserschutz: Drei G-Themen im Fokus	Agrarmanager (2015), No. 8, pp. 58-61	There is no environmental fate data related to glyphosate. The article talks about farm machinery.
1190	Fate and behaviour in the environment	Sandy E. H. et al.	2013	Oxygen isotope signature of UV degradation of glyphosate and phosphonoacetate: tracing sources and cycling of phosphonates.	Journal of hazardous materials (2013), Vol. 260, pp. 947-54	Experiments on the reaction mechanism of molecule cleavage uder UV radiation at pH 2.5 are not relevant to the data requirements.
1191	Fate and behaviour in the environment	Schulte-Oehlmann U. et al.	2011	Before the curtain falls: endocrine-active pesticides - a German contamination legacy.	Reviews of environmental contamination and toxicology (2011), Vol. 213, pp. 137-59	Literature review on pesticide occurrence in Germany. Neither experimental data nor specific results for glyphosate are reported.
1192	Fate and behaviour in the environment	Sebiomo A. et al.	2012	The impact of four herbicides on soil minerals	Research Journal of Environmental and Earth Sciences (2012), Vol. 4, No. 6, pp. 617-624	Soils tested originate from region not representative for Europe (Nigeria) no analysis of glyphosate residues, only mineral ions (calcium, sodium, potassium, magnesium, zinc and iron)
1193	Fate and behaviour in the environment	Sen K. et al.	2017	Statistical optimization study of adsorption parameters for the removal of glyphosate on forest soil using the response surface methodology	Environmental earth sciences (2017), Vol. 76, No. 1, pp. 22	Experiments on glyphosate removal by Indian forest soils are not relevant to the data requirements.
1194	Fate and behaviour in the environment	Shanmugam S. R. et al.	2019	Adsorption and desorption behavior of herbicide using bio-based materials	Transactions of the ASABE (2019), Vol. 62, No. 6, pp. 1435-1445	Adsorption of glyphosate to activated carbon and biochar was measured as a potential soil amendment to bind glyphosate. Not relevant to EU risk assessment.
1195	Fate and behaviour in the environment	Shimako A. H. et al.	2017	Operational integration of time dependent toxicity impact category in dynamic LCA	Science of the Total Environment (2017), Vol. 599-600, pp. 806-819	Life-cycle assessment. No specific glyphosate end-points that can be used in EU assessment.
1196	Fate and behaviour in the environment	Shipitalo M. J. et al.	2010	Impact of grassed waterways and compost filter socks on the quality of surface runoff from corn fields.	Journal of environmental quality (2010), Vol. 39, No. 3, pp. 1009-18	Field experiments performed in the US on concentration of glyphosate in run-off from experimental watersheds cropped with glyphosate-tolerant corn collected in grassed artificial waterways and removal by artificial compost filter socks. These are not relevant to the data requirements and not representative for EU agricultural practice.
1197	Fate and behaviour in the environment	Shushkova T. et al.	2010	Glyphosate bioavailability in soil.	Biodegradation (2010), Vol. 21, No. 3, pp. 403-10	Experiments on soil degradation and adsorption in soil columns amended with mineral salts and introduced bacteria strains are not relevant to the data requirement

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1198	Fate and behaviour in the environment	Si Y-B. et al.	2013	Complex Interaction and Adsorption of Glyphosate and Lead in Soil	Soil & sediment contamination (2013), Vol. 22, No. 1, pp. 72-84	Experiments on the influence of Pb on glyphosate adsorption in NaNO3 solution are not relevant to the data requirements
1199	Fate and behaviour in the environment	Silva J. T. B. et al.	2018	Glyphosate and turbidity removal in water conditions by clarification with Tanfloc. Remocao de glifosato e turbidez em meio aquoso por meio da clarificacao com Tanfloc	Periodico Tche Quimica (2018), Vol. 15, No. 30, pp. 489-496	Demonstrates glyphosate removal from raw water at pH 5.0 - 5.5 using natural tannin flocculant, but glyphosate concentration tested (8 mg/L) is not a relevant concentration for water treatment.
1200	Fate and behaviour in the environment	Sjerps R. M. A. et al.	2017	Projected impact of climate change and chemical emissions on the water quality of the European rivers Rhine and Meuse: A drinking water perspective	Science of the Total Environment (2017), Vol. 601-602, pp. 1682-1694	No new data are presented. Modeling of future surface water quality (year 2050) based on assumptions on climate change and future emission scenarios are not relevant to the data requirements.
1201	Fate and behaviour in the environment	Smith D. R. et al.	2015	What is causing the harmful algal blooms in Lake Erie?	Journal of soil and water conservation (2015), Vol. 70, No. 2, p. 27A-29A	Paper is a general review with no new data about reasons for increased soluble P loading to Lake Erie.
1202	Fate and behaviour in the environment	Sonne A. T. et al.	2017	Assessing the chemical contamination dynamics in a mixed land use stream system	Water Research (2017), Vol. 125, pp. 141-151	No glyphosate measurements reported from water monitoring. Some AMPA monitoring but source of AMPA unknown hence not relevant for risk assessment.
1203	Fate and behaviour in the environment	Struger J. et al.	2015	Sources of aminomethylphosphonic acid (AMPA) in urban and rural catchments in Ontario, Canada: Glyphosate or phosphonates in wastewater?.	Environmental pollution (2015), Vol. 204, pp. 289-97	Results of concentration measurements in Canadian urban and rural catchments are not representative for European agricultural practice.
1204	Fate and behaviour in the environment	Styczen M. et al.	2011	Macroscopic Evidence of Sources of Particles for Facilitated Transport during Intensive Rain	Vadose zone journal (2011), pp. 1151-1161	No new experimental data generated, only review & conclusions on results of data from literature.
1205	Fate and behaviour in the environment	Sviridov A. V. et al.	2011	New approaches to identification and activity estimation of glyphosate degradation enzymes.	Biochemistry. Biokhimiia (2011), Vol. 76, No. 6, pp. 720-5	Experiments on isolated and cultivated bacteria are not relevant to EU data requirement.
1206	Fate and behaviour in the environment	Sviridov A. V. et al.	2012	Distribution of glyphosate and methylphosphonate catabolism systems in soil bacteria Ochrobactrum anthropi and Achromobacter sp.	Applied Microbiology and Biotechnology (2012), Vol. 93, pp. 787-796	Experiments on isolated and cultivated bacteria are not relevant to the EU data requirements.
1207	Fate and behaviour in the environment	Tang X. et al.	2012	A review of rapid transport of pesticides from sloping farmland to surface waters: Processes and mitigation strategies.	JOURNAL OF ENVIRONMENTAL SCIENCES (2012), Vol. 24, No. 3, pp. 351-361	The paper is a review of pesticide transport from sloping farmland to surface water. Glyphosate is not explicitly mentioned.

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1208	Fate and behaviour in the environment	Tzaskos D. F. et al.	2012	Development of sampling for quantification of glyphosate in natural waters.	Ciencia e Agrotecnologia (2012), Vol. 36, No. 4, pp. 399-405	Development of an analytical method for water analysis in Brazil is not relevant to the data requirements for environmental fate. The analyses of Brazilian stream water samples from an area with transgenic soy plantations are not representative for European agricultural practice.
1209	Fate and behaviour in the environment	Van Stempvoort D. R. et al.	2016	Glyphosate residues in rural groundwater, Nottawasaga River Watershed, Ontario, Canada.	Pest management science (2016), Vol. 72, No. 10, pp. 1862-72	Results of concentration measurements in Canadian shallow rural groundwater are not representative for European agricultural practice.
1210	Fate and behaviour in the environment	Virginia A. et al.	2018	Industrial agriculture and agroecological transition systems: A comparative analysis of productivity results, organic matter and glyphosate in soil	Agricultural systems (2018), pp. 103-112	Economic and ecological study performed in Argentina. Comparison of industrial agriculture with agro-ecological system. Soil organic matter and glyphosate / AMPA concentrations in soil measured in addition to economic measures.
1211	Fate and behaviour in the environment	Vrain T. C.	2016	The nutritional status of GMOs	Acta horticulturae (2016), No. 1124, pp. 97-100	Limited review and commentary on glyphosate properties in relation to GMO nutritional status.
1212	Fate and behaviour in the environment	Waiman C. V. et al.	2013	A real time in situ ATR-FTIR spectroscopic study of glyphosate desorption from goethite as induced by phosphate adsorption: effect of surface coverage.	Journal of colloid and interface science (2013), Vol. 394, pp. 485-9	Adsorption experiments with isolate minerals (geothite and magnetite) are not relevant to the data requirements.
1213	Fate and behaviour in the environment	Wang K. et al.	2018	Application of least-squares support vector machines for quantitative evaluation of known contaminant in water distribution system using onlinewater quality parameters	Sensors (2018), Vol. 18, No. 4, pp. 938/1-938/19	No reference to glyphosate, AMPA, HMPA
1214	Fate and behaviour in the environment	Welch H. L.	2015	Occurrence of pesticides in groundwater underlying areas of high-density row-crop production in Alabama, 2009-2013	Scientific Investigations Report (2015), 2015-5014, 1-44	Groundwater monitoring data from areas of high density row-crop production in the US are not representative for European agricultural practice.
1215	Fate and behaviour in the environment	Wu X. et al.	2011	Degradation characteristics of organophosphate-degradation microorganism BR13.	Environmental Science & Technology (2011), Vol. 34, No. 11, pp. 54-58	Experiments on degradation of glyphosate by individual micro-organisms isolated from activated sludge are not relevant to the data requirements.
1216	Fate and behaviour in the environment	Xiao G. et al.	2020	D151 resin preloaded with Fe(3+) as a salt resistant adsorbent for glyphosate from water in the presence 16% NaCl	Ecotoxicology and environmental safety (2020), Vol. 190, pp. 110140	Experimental investigation of resins for removal of glyphosate from water. Not relevant for EU risk assessment.
1217	Fate and behaviour in the environment	Yadav V. et al.	2017	Effect of light conditions and chemical characteristics of water on dissipation of glyphosate in aqueous medium.	Environmental monitoring and assessment (2017), Vol. 189, No. 12, pp. 613	Non-EU study (India). Used glyphosate formulation to study degradation of glyphosate in distilled water and local water. Not relevant for EU risk assessment.

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1218	Fate and behaviour in the environment	Yang X. et al.	2015	Short-term transport of glyphosate with erosion in Chinese loess soil - a flume experiment.	The Science of the total environment (2015), Vol. 512-513, pp. 406-414	Laboratory experiments on run-off with hydraulic flumes are not relevant to EU data requirements.
1219	Fate and behaviour in the environment	Zhang X. et al.	2019	Photomineralization of Effluent Organic Phosphorus to Orthophosphate under Simulated Light Illumination	Environmental Science & Technology (2019), Vol. 53, No. 9, pp. 4997-5004	Study of photomineralization of Effluent Organic Phosphorus (including glyphosate) to Orthophosphate under Simulated Light Illumination. Not relevant to EU risk assessment.
1220	Fate and behaviour in the environment	Zhao Y. Q. et al.	2013	Current status of pesticides application and their residue in the water environment in Ireland	International journal of environmental studies (2013), Vol. 70, No. 1, pp. 59-72	Glyphosate use data are the basis on suggesting potential water pollution without presenting any water monitoring data.
1221	Residues in or on treated products, food and feed	Adeniyi O. et al.	2016	Quantitation of pesticide residue in water and food in Louisiana, USA	Journal of Water Resource and Protection (2016), Vol. 8, No. 12, pp. 1145-1157	Not relevant. Glyphosate not included in analysis.
1222	Residues in or on treated products, food and feed	Aikpo H. F. et al.	2016	Evaluation de la contamination des tubercules de manioc (Manihot esculenta Crantz) par les pesticides dans la zone cotonniere de Djidja (Benin) [Evaluation of contamination of cassava tubers (Manihot esculenta Crantz) by pesticides in cotton area of Djid	International Journal of Innovation and Applied Studies (2016), Vol. 14, no. 3, pp. 744	Based on the abstract the publication is likely to provide information on the uptake of glyphosate residues by root crops. However, since there is no information on the amount of glyphosate applied (if any), it is not possible to draw any conclusion from the results presented.
1223	Residues in or on treated products, food and feed	Bandana B. et al.	2015	Dissipation kinetics of glyphosate in tea and tea-field under northwestern mid-hill conditions of India	Journal of Pesticide Science (2015), Vol. 40, No. 3, 82 pp. 2015	Concerns a crop that is not a representative crop for renewal.
1224	Residues in or on treated products, food and feed	Barker A. L. et al.	2019	Fate of Glyphosate during Production and Processing of Glyphosate-Resistant Sugar Beet (Beta vulgaris).	Journal of agricultural and food chemistry (2019), Vol. 67, No. 7, pp. 2061-2065	Provides information on processing of glyphosate in glyphosate tolerant sugar beet. Not a relevant use for renewal.
1225	Residues in or on treated products, food and feed	Bertrand S.	2010	Pesticide consumption at farm level and residues in the environment and in milk	Bulletin of the International Dairy Federation (2010), Vol. 443, pp. 33-38	Article focuses on intake of pesticides by farm animals in general. Glyphosate is only mentioned in one table (list of log POW) and the examples given and described in the article deal with other active substances.
1226	Residues in or on treated products, food and feed	Boily M. et al.	2017	Foraging in maize field areas: A risky business?	Science of the Total Environment (2017), Vol. 601, pp. 1522-1532	Study compared conventionally and organically grown crops. Results could not be attributed to glyphosate, other products used on conventional plot.
1227	Residues in or on treated products, food and feed	Ciasca B. et al.	2020	Rapid and reliable detection of glyphosate in pome fruits, berries, pulses and cereals by flow injection - Mass spectrometry.	Food chemistry (2020), Vol. 310, pp. 125813	Residue analytical method. Wheat and chickpea not relevant to the uses considered for renewal in the EU. Only few real samples analysed. Therefore, not "representative" in terms of monitoring.

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1228	Residues in or on treated products, food and feed	Gelinas P. et al.	2018	Wheat preharvest herbicide application, whole-grain flour properties, yeast activity and the degradation of glyphosate in bread	International journal of food science & technology (2018), Vol. 53, No. 7, pp. 1597-1602	Provides information on effects of glyphosate on flour properties in baking following preharvest application in wheat. Not a relevant use for renewal.
1229	Residues in or on treated products, food and feed	Ghazala Y. et al.	2018	Monitoring and risk assessment due to presence of heavy metals and pesticides in tea samples.	Food Science and Technology (Campinas),(2018), Vol. 38, No. 4, pp. 625-628	Reports on glyphosate detection in tea samples from Pakistan, but with no information on the analytical method used or way to evaluate results. Not relevant to EU risk assessment.
1230	Residues in or on treated products, food and feed	Goen T. et al.	2017	Efficiency control of dietary pesticide intake reduction by human biomonitoring.	International journal of hygiene and environmental health (2017), Vol. 220, No. 2 Pt A, pp. 254-260	Pilot study of differences in urinary levels of several pesticides (including glyphosate) for two individuals following a conventional or organic diet. Limited data; not relevant for risk assessment.
1231	Residues in or on treated products, food and feed	Goldstein D. A.	2017	Glyphosate residues in feed.	Journal of Animal Science (2017), Vol. 95, 367 p., Suppl. 4	Overview of MRL process and summary of glyphosate in food and feed.
1232	Residues in or on treated products, food and feed	Gotti R. et al.	2019	Field-amplified sample injection and sweeping micellar electrokinetic chromatography in analysis of glyphosate and aminomethylphosphonic acid in wheat.	Journal of chromatography A (2019), Vol. 1601, pp. 357-364	Primarily an analytical methods paper. The authors report the analysis of 4 commercial wheat flour samples (residues below detection limit) and one wheat grain sample (glyphosate residues 243 mg/kg). The grain sample was from plants sprayed pre-harvest in a growth chamber; no details on application rate and timing provided, so cannot assess residues.
1233	Residues in or on treated products, food and feed	Herrera Lopez S. et al.	2019	Method validation and application of a selective multiresidue analysis of highly polar pesticides in food matrices using hydrophilic interaction liquid chromatography and mass spectrometry	Journal of Chromatography A (2019), 1594, 93-104	Analytical method; no monitoring data.
1234	Residues in or on treated products, food and feed	Jan M. R. et al.	2018	Flow injection spectrophotometric determination of glyphosate herbicide in wheat grains via condensation reaction with p-dimethylaminobenzaldehyde	South African Journal of Chemistry (2018), 71(1), 39-45	This is primarily an analytical method paper. No details of analysis of real samples included, just overall average of 62 wheat grain samples from South Africa.
1235	Residues in or on treated products, food and feed	John J. et al.	2018	Glyphosate monitoring in water, foods, and urine reveals an association between urinary glyphosate and tea drinking: a pilot study.	International Journal of Environmental Health Engineering (2018), Vol. 7, 2 p	Pilot study in non-EU country (US) with limited analysis of food and urine samples, using semi-quantitative ELISA assay developed for water and with no reporting of validation in other matrices. Exposure assessment not relevant for EU consumers.
1236	Residues in or on treated products, food and feed	Khan N. et al.	2016	HPLC determination and comparative analysis of persistent organic compounds in different environmental matrices	Asian Journal of Chemistry (2016), Vol. 28, No. 2, pp. 339-342	No analytical results (or even validation data) for glyphosate
1237	Residues in or on treated products, food and feed	Lopez-Blanco R. et al.	2018	Experimental and theoretical determination of pesticide processing factors to model their behavior during virgin olive oil production	Food Chemistry (2018), Vol. 239, pp. 9-16	No glyphosate data included in article (only trimesium ion).

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1238	Residues in or on treated products, food and feed	Machado B. A. et al.	2019	X-ray Spectroscopy Fostering the Understanding of Foliar Uptake and Transport of Mn by Soybean (Glycine max L. Merril): Kinetics, Chemical Speciation, and Effects of Glyphosate.	Journal of agricultural and food chemistry (2019), Vol. 67, No. 47, pp. 13010-13020	No data on the transport of glyphosate in the crop; No glyphosate residue data; Furthermore it is not good agriculture practice to tank mix glyphosate with a fertilizer.
1239	Residues in or on treated products, food and feed	Mesnage R. et al.	2015	Laboratory Rodent Diets Contain Toxic Levels of Environmental Contaminants: Implications for Regulatory Tests.	PloS one (2015), Vol. 10, No. 7, pp. e0128429	Measures levels of GMOs and various contaminants (including glyphosate and AMPA) in rodent diets.
1240	Residues in or on treated products, food and feed	Nandula V. K. et al.	2015	Herbicide Absorption and Translocation in Plants using Radioisotopes.	Weed Science (2015), Vol. 63, No. Sp. Iss. 1, pp. 140-151	Methodology paper on the conduct of absorption and translocation studies of herbicides using radioisotopes.
1241	Residues in or on treated products, food and feed	Nougadere A. et al.	2011	Chronic dietary risk characterization for pesticide residues: A ranking and scoring method integrating agricultural uses and food contamination data	Food and Chemical Toxicology (2011), Vol. 49, No. 7, pp. 1484-1510	The article presents a method to identify pesticide residues and foodstuffs for inclusion in national monitoring programs with different priority levels. In the article a large number ofactive substances are included. For glyphosate the conclusion does not change the end-point for the dietary risk assessment.
1242	Residues in or on treated products, food and feed	Oliveira P. C. et al.	2018	Direct electrochemical detection of glyphosate at carbon paste electrode and its determination in samples of milk, orange juice, and agricultural formulation.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2018), Vol. 53, No. 12, pp. 817-823	Analytical method. Study did not include analysis of any relevant samples (only fortified samples).
1243	Residues in or on treated products, food and feed	Perboni L. T. et al.	2018	Yield, germination and herbicide residue in seeds of preharvest desiccated wheat	JOURNAL OF SEED SCIENCE (2018), Vol. 40, No. 3, pp. 304-312	Provides information on glyphosate pre-harvest use in wheat. Not a relevant use for renewal.
1244	Residues in or on treated products, food and feed	Poppi A. C. O. et al.	2018	Influence of chemical pesticides on the survival of lactic acid bacteria in silage inoculants.	Proceedings of the International Silage Conference (XVIII ISC 2018), 24-26 July 2018, Bonn, Germany (2018), pp. 312-313	Effect of inadvertant contamination of silage innoculant with glyphosate in spray tank.
1245	Residues in or on treated products, food and feed	Tang X. Y. et al.	2018	Uptake, translocation, distribution and metabolism of glyphosate in target weeds and non-target tea trees in tea garden.	Journal of Food Safety and Quality (2018), Vol. 9, No. 18, pp. 4900-4905	The article does not include new data on metabolism of glyphosate in tea, but rather summarizes existing data.
1246	Residues in or on treated products, food and feed	Tassielli G. et al.	2018	Environmental life cycle assessment of fresh and processed sweet cherries in southern Italy	Journal of Cleaner Production (2018), 171, 184-197	Life cycle analysis of different production methods in cherry orchards. Glyphosate is one of numerous pesticides used during cultivation. No observations related to glyphosate in study.
1247	Residues in or on treated products, food and feed	Tu Q. et al.	2019	In situ colorimetric detection of glyphosate on plant tissues using cysteamine-modified gold nanoparticles.	The Analyst (2019), Vol. 144, No. 6, pp. 2017-2025	Analytical method for in situ visual detection of glyphosate in field treated samples. Not relevant for risk assessment.
1248	Residues in or on treated	Van Eenennaam A. L. et al.	2017	Detection of dietary DNA, protein, and glyphosate in meat, milk, and eggs.	Journal of animal science (2017), Vol. 95, No. 7, pp. 3247-3269	Review of existing information on glyphosate residues in meat, milk and eggs. No new data.

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	products, food and feed					
1249	Residues in or on treated products, food and feed	Wumbei A. et al.	2019	Glyphosate in yam from Ghana	Food Additives & Contaminants, Part B: Surveillance (2019), Vol. 12, No. 4, pp. 231-235	Description of analytical method and use in analyzing yam samples from Ghana. Some samples had detectable residues (>0.04 mg/kg), all below the LOQ of 0.12 mg/kg. Not relevant - method had low recovery (34%) and results not relevant for EU.
1250	Residues in or on treated products, food and feed	Zhao J. et al.	2018	Detection of glyphosate residues in companion animal feeds.	Environmental pollution (2018), Vol. 243, No. Pt B, pp. 1113-1118	Analysis of glyphosate residues in companion animal feed.
1251	Toxicology and metabolism	Abarikwu S. O. et al.	2015	Combined effects of repeated administration of Bretmont Wipeout (glyphosate) and Ultrazin (atrazine) on testosterone, oxidative stress and sperm quality of Wistar rats.	Toxicology mechanisms and methods (2015), Vol. 25, No. 1, pp. 70-80	Formulation provided to Wistar rats via oral gavage in corn oil.
1252	Toxicology and metabolism	Abass K. et al.	2012	Characterization of human cytochrome P450 induction by pesticides	Toxicology (2012), Vol. 294, No. 1, pp. 17-26	No significant glyphosate related effects.
1253	Toxicology and metabolism	Abass K. et al.	2013	The inhibition of major human hepatic cytochrome P450 enzymes by 18 pesticides: Comparison of the N-in-one and single substrate approaches	Toxicology In Vitro (2013), Vol. 27, No. 5, pp. 1584-1588	Glyphosate not mentioned in the paper.
1254	Toxicology and metabolism	Aboukila R. S. et al.	2014	Cytogenetic study on the effect of bentazon and glyphosate herbicide on mice.	Alexandria Journal of Veterinary Sciences (2014), Vol. 41, pp. 95-101	This publication is considered not relevant because a glyphosate formulation (Glalica) was used instead of glyphosate and the route of administration was intraperitoneal injection which is an inappropriate route of administration for the occupational and food risk assessment of glyphosate.
1255	Toxicology and metabolism	Addae J. I. et al.	2011	Effects of AMPA and clomethiazole on spreading depression cycles in the rat neocortex in vivo	European Journal of Pharmacology (2011), Vol. No. 1-3, pp. 41-46	The article is investigating AMPA Receptor with drugs applied i.p. and topically.
1256	Toxicology and metabolism	Alarcon R. et al.	2019	Neonatal exposure to a glyphosate-based herbicide alters the histofunctional differentiation of the ovaries and uterus in lambs.	Molecular and cellular endocrinology (2019), Vol. 482, pp. 45-56	Formulation tested (Roundup Full II, Argos SRL, Santa Fe, Argentina; 54 g/100 mL glyphosate)
1257	Toxicology and metabolism	Altamirano G. A. et al.	2018	Postnatal exposure to a glyphosate-based herbicide modifies mammary gland growth and development in Wistar male rats.	Food and chemical toxicology (2018), Vol. 118, pp. 111-118	Formulation tested (Roundup FULL II, potassium salt; 54% a.e.)
1258	Toxicology and metabolism	Aminov A. I. et al.	2013	Effect of the herbicide Roundup on the activity of Glycosidases of invertebrates and juvenile fish.	Inland Water Biology (2013), Vol. 6, No. 4, pp. 351-356	Formulation tested in vitro (Roundup, produced and packaged by ZAO Avgust, Russia; 36% glyphosate).
1259	Toxicology and metabolism	Anakwue R.	2019	Cardiotoxicity of Pesticides: Are Africans at Risk?	Cardiovascular toxicology (2019), Vol. 19, No. 2, pp. 95-104	Review article with no new data.
1260	Toxicology and metabolism	Anifandis G. et al.	2017	The In Vitro Impact of the Herbicide Roundup on Human Sperm Motility and Sperm Mitochondria.	Toxics (2017), Vol. 6, No. 1, pp. 2	Formulation tested in vitro (Roundup, not characterized).

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1261	Toxicology and metabolism	Williams, G. M. et al.	2018	Corrigendum to: A review of the carcinogenic potential of glyphosate by four independent expert panels and comparison to the IARC assessment (Critical Reviews in Toxicology, (2016), 46, sup1, (3-20), 10.1080/10408444.2016.1214677).	Critical Reviews in Toxicology (2018), Vol. 48, No. 10, pp 907-908	Corrigendum to paper updating acknowledgements and author conflicts of interest.
1262	Toxicology and metabolism	Mesnage R. et al.	2017	Erratum to: Transcriptome profile analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure (Environmental Health: A Global Access Science Source (2015) 14:70 DOI: 10.1186/s12940-015-0056-1).	Environmental Health (2017), Vol. 16, No. 1, pp. 28	This is erratum to Mesnage et al., Environmental health (2015), Vol. 14, article No. 70.
1263	Toxicology and metabolism	Anon.	2013	Pesticide Exposure in Children (vol 130, pg e1757, 2012).	Pediatrics (2013), Vol. 131, No. 5, pp. 1013	No glyphosate data generated/presented.
1264	Toxicology and metabolism	Antoniou M. N. et al.	2019	Glyphosate does not substitute for glycine in proteins of actively dividing mammalian cells.	BMC research notes (2019), Vol. 12, No. 1, pp. 494	This publication is found not relevant because the end-point investigated (substitution of glycine by glyphosate in protein synthesis) is not appropriate for the risk assessment of glyphosate.
1265	Toxicology and metabolism	Aroonvilairat S. et al.	2015	Effect of pesticide exposure on immunological, hematological and biochemical parameters in Thai orchid farmers-a cross-sectional study	International Journal of Environmental Research and Public Health (2015), Vol. 12, No. 6, pp. 5846-5861	This is a general pesticides paper and not specific to glyphosate.
1266	Toxicology and metabolism	Asita A. O. et al.	2012	Cytotoxicity and genotoxicity of some agropesticides used in Southern Africa	Journal of Toxicology and Environmental Health Sciences (2012), Vol. 4, No. 10, pp. 175-184	Formulation tested in vitro (Wipe-out, Kombat (Pty) Ltd, South Africa; 360 g/L glyphosate). Tested a plant species with a herbicide for adverse end-points; not relevant to human health end-points.
1267	Toxicology and metabolism	Astiz M. et al.	2012	The oxidative damage and inflammation caused by pesticides are reverted by lipoic acid in rat brain.	Neurochemistry international (2012), Vol. 61, No. 7, pp. 1231-41	In vivo administration via intraperitoneal injection which is not a relevant exposure route for EU glyphosate renewal.
1268	Toxicology and metabolism	Astiz M. et al.	2013	Pesticide-induced decrease in rat testicular steroidogenesis is differentially prevented by lipoate and tocopherol.	Ecotoxicology and environmental safety (2013), Vol. 91, pp. 129-38	In vivo administration via intraperitoneal injection which is not a relevant exposure route for EU glyphosate renewal.
1269	Toxicology and metabolism	Avdatek F. et al.	2018	Ameliorative effect of resveratrol on testicular oxidative stress, spermatological parameters and DNA damage in glyphosate-based herbicide-exposed rats.	Andrologia (2018), Vol. 50, No. 7, pp. e13036	Glyphosate based formulation tested (Knockdown 48 SL) which is not comparable to the EU renewal.
1270	Toxicology and metabolism	Avdatek F. et al.	2018	Protective effect of N-acetylcysteine on testicular oxidative damage, spermatological parameters and DNA damage in glyphosate-based herbicide-exposed rats.	Kocatepe Veterinary Journal (2018), Vol. 11, No. 3, pp. 292-300	Formulation tested (Knockdown 48 SL, Turkey) which is not comparable to the EU renewal.

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1271	Toxicology and metabolism	Avila-Vazquez M. et al.	2018	Environmental exposure to glyphosate and reproductive health impacts in agricultural population of Argentina.	Journal of Environmental Protection (2018), Vol. 9, No. 3, pp. 241-253	This publication is considered not relevant for the risk assessment of glyphosate because the general population followed was exposed to multiple environmental factors making it impossible to establish a causal relationship between exposure to glyphosate and reproductive disorders.
1272	Toxicology and metabolism	Ayanda O. I. et al.	2012	Histopathological examination of the liver and gills of Clarias gariepinus treated with glyphosate.	Environmental Research Journal (2012), Vol. 6, No. 3, pp. 228-234	Formulation tested in aquatic species (Roundup 480 mg/L isopropanol salt; 360 g/L a.e.). Effects clearly attributable to surfactant.
1273	Toxicology and metabolism	Babic Z. et al.	2019	Report of the Poison Control Centre for the period from 1 January to 31 December 2018; Original title: Izvjesce Centra za kontrolu otrovanja za razdoblje od 1. sijecnja do 31. prosinca 2018	Arhiv Za Higijenu Rada i Toksikologiju (2019), Vol. 70, No. 1, pp. 69-73	Glyphosate based herbicide mentioned once and no glyphosate specific data included in the study.
1274	Toxicology and metabolism	Bader M. A. et al.	2015	Effect of quercetin against Roundup and/or fluoride induced biochemical alterations and lipid peroxidation in rats	International Journal of Pharmaceutical Sciences Review and Research (2015), Vol. 34, No. 2, pp. 168-175	Excessively high 28-day repeat dose at 500 mg/kg/day glyphosate based herbicide and is therefore not comparable to the EU glyphosate renewal.
1275	Toxicology and metabolism	Bali Y. A. et al.	2019	Learning and memory impairments associated to acetylcholinesterase inhibition and oxidative stress following glyphosate based-herbicide exposure in mice.	Toxicology (2019), Vol. 415, pp. 18-25	Formulation tested (Roundup herbicide (glyphosate concentration 360 g/l IPA salt, Monsanto) which contains a surfactant not present in the representative glyphosate used in the EU renewal process.
1276	Toxicology and metabolism	Bates N. et al.	2013	Glyphosate toxicity in animals.	Clinical Toxicology (2013), Vol. 51, No. 10, pp. 1243	Correspondence adds no new data on human health end-points.
1277	Toxicology and metabolism	Beecham J. E. et al.	2015	The possible link between autism and glyphosate acting as glycine mimetic - a review of evidence from the literature with analysis	Journal of Molecular and Genetic Medicine (2015), Vol. 9, No. 4, pp. 1000197/1-1000197/16	This publication is considered not relevant for glyphosate risk assessment because it is not based on experimental work and no epidemiologic methodology was followed.
1278	Toxicology and metabolism	Bellantuono V. et al.	2014	Pesticides alter ion transport across frog (Pelophylax kl. esculentus) skin	Chemistry in ecology (2014), Vol. 30, No. 7, pp. 602-610	End-point not relevant to human health risk assessment in the EU renewal.
1279	Toxicology and metabolism	Benitez Leite S. et al.	2019	DNA damage induced by exposure to pesticides in children of rural areas in Paraguay	Indian journal of medical research (2019), Vol. 150, No. 3, pp. 290-296	No evaluation of the glyphosate used as part of the study. Study provides a comparison of children living near transgenic soybean fields to a control group near crops managed with biological controls.
1280	Toxicology and metabolism	Beranger R. et al.	2018	Multiple pesticide analysis in hair samples of pregnant French women: Results from the ELFE national birth cohort.	Environment International (2018), Vol. 120, pp. 43-53	No data presented on glyphosate, therefore not relevant for the EU renewal.
1281	Toxicology and metabolism	Bernieri T. et al.	2019	Occupational exposure to pesticides and thyroid function in Brazilian soybean farmers.	Chemosphere (2019), Vol. 218, pp. 425-429	General pesticide exposures, not glyphosate specific, therefore not relevant for the EU renewal.
1282	Toxicology and metabolism	Bernieri T. et al.	2019	Effect of pesticide exposure on total antioxidant capacity and biochemical parameters in Brazilian soybean farmers	Drug and Chemical Toxicology (2019), Ahead of Print	General pesticide exposure biomonitoring study, not glyphosate specific and therefore not relevant for the EU renewal.

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1283	Toxicology and metabolism	Bhardwaj J. K. et al.	2019	Effective attenuation of glyphosate-induced oxidative stress and granulosa cell apoptosis by vitamins C and E in caprines.	Molecular reproduction and development (2019), Vol. 86, No. 1, pp. 42-52	Glyphosate based herbicide tested with in vitro test system. As this formulation is not the representative formulation used in the EU renewal process, it is not relevant.
1284	Toxicology and metabolism	Buralli R. J. et al.	2018	Respiratory condition of family farmers exposed to pesticides in the state of Rio de Janeiro, Brazil.	International Journal of Environmental Research and Public Health (2018), Vol. 15, No. 6, pp. 1203	General pesticide exposures, not glyphosate specific, therefore not relevant for the EU renewal.
1285	Toxicology and metabolism	Burella P. M. et al.	2017	Evaluation of Stage-Dependent Genotoxic Effect of Roundup(®) (Glyphosate) on Caiman latirostris Embryos.	Archives of environmental contamination and toxicology (2017), Vol. 72, No. 1, pp. 50-57	Glyphosate based herbicide tested on reptiles. End-point and species not relevant to EU annex I renewal.
1286	Toxicology and metabolism	Camacho A. et al.	2017	The health consequences of aerial spraying illicit crops: The case of Colombia.	Journal of health economics (2017), Vol. 54, pp. 147-160	This publication is considered not relevant for the risk assessment of glyphosate because it is too general and no specific epidemiological method was followed to establish an association between the application of glyphosate and disease outcome.
1287	Toxicology and metabolism	Caramello C. S. et al.	2017	Evaluation of herbicide glyphosate effects in the fish Prochilodus lineatus using chromosome aberration test.	Revista Veterinaria (2017), Vol. 28, No. 1, pp. 65-68	Formulation tested (Roundup Full II), not representative for the renewal.
1288	Toxicology and metabolism	Cassault-Meyer E. et al.	2014	An acute exposure to glyphosate-based herbicide alters aromatase levels in testis and sperm nuclear quality.	Environmental toxicology and pharmacology (2014), Vol. 38, No. 1, pp. 131-40	This publication is considered not relevant for the risk assessment of glyphosate because a glyphosate formulation (Roundup Grand Travaux Plus) was tested instead of glyphosate.
1289	Toxicology and metabolism	Castelani P. et al.	2013	Novel adjuvants for high load glyphosate formulations	SOFW Journal (2013), Vol. 139, No. 6, pp. 30-34,36	Formulation chemistry paper and therefore not relevant to the EU renewal of glyphosate.
1290	Toxicology and metabolism	Cattani D. et al.	2017	Developmental exposure to glyphosate-based herbicide and depressive-like behavior in adult offspring: Implication of glutamate excitotoxicity and oxidative stress.	Toxicology (2017), Vol. 387, pp. 67-80	Formulation tested (Roundup Original, Brazil, 360 g/L glyphosate), not-representative for the renewal.
1291	Toxicology and metabolism	Cattani D. et al.	2014	Mechanisms underlying the neurotoxicity induced by glyphosate-based herbicide in immature rat hippocampus: involvement of glutamate excitotoxicity.	Toxicology (2014), Vol. 320, pp. 34-45	Formulation tested (Roundup Original, Brazil, 360 g/L glyphosate), not-representative for the renewal.
1292	Toxicology and metabolism	Cattelan M. D. P. et al.	2018	Occupational exposure to pesticides in family agriculture and the oxidative, biochemical and hematological profile in this agricultural model	Life Sciences (2018), Vol. 203, pp. 177-183	General pesticide exposures, not glyphosate specific and thus not relevant to the EU renewal of glyphosate.
1293	Toxicology and metabolism	Cavusoglu K. et al.	2011	Protective effect of Ginkgo biloba L. leaf extract against glyphosate toxicity in Swiss albino mice.	Journal of medicinal food (2011), Vol. 14, No. 10, pp. 1263-72	Single dose administration intraperitoneally as well as the protective effect of a Ginkgo biloba extract. This is not representative of glyphosate exposure and therefore not relevant to the renewal.
1294	Toxicology and metabolism	Cermak A. M. M. et al.	2018	Redox imbalance caused by pesticides: a review of OPENTOX-related research.	Arhiv za higijenu rada i toksikologiju (2018), Vol. 69, No. 2, pp. 126-134	A review article of in vitro studies with no new data provided.

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1295	Toxicology and metabolism	Chaufan G. et al.	2014	Glyphosate commercial formulation causes cytotoxicity, oxidative effects, and apoptosis on human cells: differences with its active ingredient.	International journal of toxicology (2014), Vol. 33, No. 1, pp. 29-38	No effects for glyphosate and AMPA, only with formulation tested in an in vitro system. Data not biologicaly relevant to the renewal.
1296	Toxicology and metabolism	Chlopecka M. et al.	2014	Glyphosate affects the spontaneous motoric activity of intestine at very low doses - in vitro study.	Pesticide biochemistry and physiology (2014), Vol. 113, pp. 25-30	A novel ex-vivo model not relevant to the EU renewal of glyphosate.
1297	Toxicology and metabolism	Chlopecka M. et al.	2017	The effect of glyphosate-based herbicide Roundup and its co-formulant, POEA, on the motoric activity of rat intestine - In vitro study.	Environmental toxicology and pharmacology (2017), Vol. 49, pp. 156-162	Formulation and mixtures of glyphosate and surfactant tested in vitro (Roundup ULTRA 170 SL; 170 g isopropylamine salt/L). Data not biologically relevant to the renewal.
1298	Toxicology and metabolism	Clair E. et al.	2012	A glyphosate-based herbicide induces necrosis and apoptosis in mature rat testicular cells in vitro, and testosterone decrease at lower levels.	Toxicology in vitro (2012), Vol. 26, No. 2, pp. 269-79	This publication is considered not relevant for the risk assessment of glyphosate as a glyphosate formulation (Roundup Bioforce) was used instead of glyphosate for in vitro testing.
1299	Toxicology and metabolism	Clark P. A. et al.	2016	Chronic kidney disease in Nicaraguan sugarcane workers: A historical, medical, environmental analysis and ethical analysis.	Internet Journal of Third World Medicine (2016), Vol. 12, No. 1	This publication is considered not relevant for glyphosate risk assessment because no systematic epidemiological approach was followed. Similarly figures for workers were not reported, nor were exposure patterns observed.
1300	Toxicology and metabolism	Clausing P.	2017	Cancer risk by glyphosate: The "Weight of Evidence Approach" of BfR. Krebsgefahr durch Glyphosat: Der "Weight of Evidence Approach" des BfR.	Umweltmedizin Hygiene Arbeitsmedizin (2017), Vol. 22, No. 1, pp. 27-34	This publication is considered not relevant for the risk assessment of glyphosate because it is not based on experimental work.
1301	Toxicology and metabolism	Clausing P. et al.	2018	Pesticides and public health: an analysis of the regulatory approach to assessing the carcinogenicity of glyphosate in the European Union.	Journal of epidemiology and community health (2018), Vol. 72, No. 8, pp. 668-672	No new data, a commentary article therefore not relevant for the renewal of glyphosate.
1302	Toxicology and metabolism	Coalova I. et al.	2014	Influence of the spray adjuvant on the toxicity effects of a glyphosate formulation.	Toxicology in vitro (2014), Vol. 28, No. 7, pp. 1306-11	The formulation tested in vitro (Atanor, Argentina; 48% glyphosate isopropylamine salt) is not therepresentative formulation for the renewal.
1303	Toxicology and metabolism	Coon E. A. et al.	2019	Conjugal multiple system atrophy: Chance, shared risk factors, or evidence of transmissibility?.	Parkinsonism and Related Disorders (2019), Vol. 67, pp. 10-13	Glyphosate use is one of many potential environmental factors considered as a cause for multiple system atrophy, with no specific information provided.
1304	Toxicology and metabolism	Cortinovis C. et al.	2015	Glyphosate-surfactant herbicide poisoning in domestic animals: an epidemiological survey.	The Veterinary record (2015), Vol. 176, No. 16, pp. 413	Acute poisoning in animals, not relevant fort he renewal.
1305	Toxicology and metabolism	Coullery R. P. et al.	2016	Neuronal development and axon growth are altered by glyphosate through a WNT non-canonical signaling pathway.	Neurotoxicology (2016), Vol. 52, pp. 150-61	High in vitro doses >10 mM of glyphosate, therefore not representative of use/exposure and not relevant for the renewal.
1306	Toxicology and metabolism	Dar M. A.. et al.	2015	Single and interactive toxic potential of Roundup and ammonium nitrate on Haemato-biochemical parameters in wistar rats	Journal of Cell and Tissue Research (2015), Vol. 15, No. 3, pp. 5295-5299	High dose of Glyphosate based herbicide administered to rats in drinking water. As this is not the representative formulation, the article is not relevant to the renewal.

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1307	Toxicology and metabolism	Dar M. A. et al.	2018	Sub-acute oral toxicity of Roundup® and ammonium nitrate with special reference to oxidative stress indices in wistar rats.	Indian Journal of Animal Research (2018), Vol. 52, No. 3, pp. 405-408	Formulation tested Roundup® (Glyphosate 41 % EC, SD Fine Chemicals Mumbai, India); this is not representative for the EU renewal.
1308	Toxicology and metabolism	Dar M. A. et al.	2019	Effect of Repeated Oral Administration of Roundup((R)) and Ammonium Nitrate on Liver of Wistar Rats.	Proceedings of the Indian National Science Academy Part B Biological Sciences (2019), Vol. 89, No. 2, pp. 505-510	Formulation tested (Roundup, 41% EC) which is not the representative formulation used in the renewal.
1309	Toxicology and metabolism	Dardiotis E. et al.	2019	Pesticide exposure and cognitive function: Results from the Hellenic Longitudinal Investigation of Aging and Diet (HELIAD)	Environmental Research (2019), Vol. 177, pp. 108632	This publication is considered not relevant for the risk assessment of glyphosate because exposure to glyphosate is not documented.
1310	Toxicology and metabolism	de Adad L. M. M. et al.	2015	Occupational exposure of workers to pesticides: Toxicogenetics and susceptibility gene polymorphisms.	Genetics and Molecular Biology (2015), Vol. 38, No. 3, pp. 308-315	Not specific to glyphosate and therefore not relevant to the renewal.
1311	Toxicology and metabolism	de Aguiar L. M. et al.	2016	Glyphosate-based herbicide exposure causes antioxidant defence responses in the fruit fly Drosophila melanogaster.	Comparative biochemistry and physiology. Toxicology & pharmacology (2016), Vol. 185-186, pp. 94-101	Tested formulation (Roundup Original) for cellular mechanisms in houseflies, not directly relevant to human health risk assessment in the EU renewal of glyphosate.
1312	Toxicology and metabolism	de Castilhos Ghisi N. et al.	2013	Genotoxic effects of the herbicide Roundup(®) in the fish Corydoras paleatus (Jenyns 1842) after short-term, environmentally low concentration exposure	Environmental monitoring and assessment (2013), Vol. 185, No. 4, pp. 3201-7	Glyphosate based herbicide tested in aquatic species. As this is not the representative formulation, the article is not relevant to the renewal.
1313	Toxicology and metabolism	de Melo M. I. A. et al.	2018	Glyphosate-based herbicide induces toxic effects on human adipose-derived mesenchymal stem cells grown in human plasma.	Comparative Clinical Pathology (2018), Vol. 27, No. 4, pp. 989-1000	Glyphosate based herbicide tested in an in vitro system.
1314	Toxicology and metabolism	de Liz Oliveira Cavalli V. L. et al.	2013	Roundup disrupts male reproductive functions by triggering calcium-mediated cell death in rat testis and Sertoli cells.	Free radical biology & medicine (2013), Vol. 65, pp. 335-46	Formulation tested in vitro was Roundup Original, 360 g/L, a.e., Brazil. As this is not the representative formulation, the article is not relevant to the renewal.
1315	Toxicology and metabolism	de Moura F. R. et al.	2017	Effects of glyphosate-based herbicide on pintado da Amazonia: Hematology, histological aspects, metabolic parameters and genotoxic potential.	Environmental toxicology and pharmacology (2017), Vol. 56, pp. 241-248	The effects of high doses of Glyphosate based herbicide to aquatic species was assessed. As this is not the representative formulation, the article is not relevant to the renewal.
1316	Toxicology and metabolism	de Oliveira A. F. B. et al.	2019	Investigation of pesticide exposure by genotoxicological, biochemical, genetic polymorphic and in silico analysis	Ecotoxicology and Environmental Safety (2019), 179, 135-142	This publication is considered not relevant for the risk assessment of glyphosate because it is not specific to glyphosate. Focuses on mixtures of pesticides. It is not possible to establish a causal relationship between the biological endpoints assessed and exposure to glyphosate.
1317	Toxicology and metabolism	de Oliveira Joaquim A. et al.	2014	Effects of exposure to glyphosate in male and female mice behavior in pubertal period.	Brazilian Journal of Veterinary Research and Animal Science (2014), Vol. 51, No. 3, pp. 194-203	This publication is considered not relevant for the risk assessment of glyphosate because a formulation (Roundup Transorb) was used instead of glyphosate.

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1318	Toxicology and metabolism	de Oliveira Joaquim A. et al.	2012	Behavioral effects of acute glyphosate exposure in male and female Balb/c mice.	Brazilian Journal of Veterinary Research and Animal Science (2012), Vol. 49, No. 5, pp. 367-376	Formulation tested in vivo was Roundup Transorb, 648 g/L of isopropylamine salt, 480 g/L a.e., Brazil. As this is not the representative formulation, the article is not relevant to the renewal.
1319	Toxicology and metabolism	de Ribeiro Sena T. R. et al.	2019	[High frequency hearing among rural workers exposed to pesticides] Audicao em altas frequencias em trabalhadore0s rurais expostos a agrotoxicos	Ciencia & saude coletiva (2019), Vol. 24, No. 10, pp. 3923-3932	No glyphosate specific data, confounded due to multiple pesticide uses therefore cannot be used in the renewal.
1320	Toxicology and metabolism	de Souza J. S. et al.	2019	Maternal glyphosate-based herbicide exposure alters antioxidant-related genes in the brain and serum metabolites of male rat offspring.	Neurotoxicology (2019), Vol. 74, pp. 121-131	Formulated product tested was Glyphosate Roundup Transorb; Monsanto of Brazil Ltda, São Paulo, Brazil. As this is not the representative formulation, the article is not relevant to the renewal.
1321	Toxicology and metabolism	de Souza J. S. et al.	2017	Perinatal exposure to glyphosate-based herbicide alters the thyrotrophic axis and causes thyroid hormone homeostasis imbalance in male rats.	Toxicology (2017), Vol. 377, pp. 25-37	This publication is considered not relevant for the risk assessment of glyphosate because a glyphosate formulation (Roundup Transorb) was used instead of glyphosate.
1322	Toxicology and metabolism	Defarge N. et al.	2018	Toxicity of formulants and heavy metals in glyphosate-based herbicides and other pesticides.	Toxicology reports (2018), Vol. 5, pp. 156-163	This paper is deemed not relevant as a non-representative formulation was tested as opposed to glyphosate.
1323	Toxicology and metabolism	Deshmukh U. S. et al.	2013	Effect of acute exposure of glyphosate herbicide, on wistar rats with reference to haematology and biochemical analysis	Bioscan (2013), Vol. 8, No. 2, pp. 381-383	Formulation tested in vivo at excessively high dose of 4000 mg/kg/day for 7 days and is therefore not applicable to the EU renewal.
1324	Toxicology and metabolism	Dhananjayan V. et al.	2019	Assessment of genotoxicity and cholinesterase activity among women workers occupationally exposed to pesticides in tea garden	Mutation Research, Genetic Toxicology and Environmental Mutagenesis (2019), Vol. 841, pp. 1-7	General pesticide exposure evaluation, not glyphosate specific therefore not applicable to the EU renewal.
1325	Toxicology and metabolism	Dhanarajam Y. et al.	2013	Haemato-biochemical studies on glyphosate induced toxicity in rats.	Journal of Interacademicia (2013), Vol. 17, No. 3, pp. 512-517	Formulation tested in vivo, via oral gavage at high doses of 400 and 800 mg/kg/day for 28 days (Roundup, 41% isopropylamine salt). As this is not the representative formulation, the article is not relevant to the renewal.
1326	Toxicology and metabolism	Diaz-Criollo S. et al.	2019	Chronic pesticide mixture exposure including paraquat and respiratory outcomes among Colombian farmers.	Industrial health (2019), Vol. 58, No. 1, pp. 15-21	Mixtures paper, focused on paraquat mixtures therefore not relevant to the EU renewal.
1327	Toxicology and metabolism	Schrenk D.	2018	What is the meaning of 'A compound is carcinogenic'?.	Toxicology reports (2018), Vol. 5, pp. 504-511	This publication is considered not relevant for the risk assessment of glyphosate as it concerns the classification of carcinogens in general and not glyphosate in particular.
1328	Toxicology and metabolism	Diken M. E. et al.	2017	In vitro effects of some pesticides on glutathione-s transferase activity.	Fresenius Environmental Bulletin (2017), Vol. 26, No. 12A, pp. 8023-8029	Formulations tested at excessively high in vitro doses in the mM range and is therefore not applicable to the EU renewal.
1329	Toxicology and metabolism	Dimpfel W. et al.	2018	Effect of Zembrin® and four of its alkaloid constituents on electric excitability of the rat hippocampus.	Journal of Ethnopharmacology (2018), Vol. 223, pp. 135-141	AMPA described in the paper is not aminomethylphosphonic acid, rather α-amino-3-hydroxy-5-methyl-4-isoxazole-propionic acid, therefore not relevant to the renewal.

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1330	Toxicology and metabolism	Djaldetti R. et al.	2019	The role of exposure to pesticides in the etiology of Parkinson's disease: a 18F-DOPA positron emission tomography study.	Journal of Neural Transmission (2019), Vol. 126, No. 2, pp. 159-166	A general pesticides paper which does not present any new glyphosate specific data. Therefore not relevant to the renewal.
1331	Toxicology and metabolism	dos Santos K. C. et al.	2014	Genotoxic and biochemical effects of atrazine and Roundup(®), alone and in combination, on the Asian clam Corbicula fluminea.	Ecotoxicology and environmental safety (2014), Vol. 100, pp. 7-14	A glyphosate based herbicide was tested on an aquatic invertebrate. As this is not the representative formulation, the article is not relevant to the renewal.
1332	Toxicology and metabolism	Douwes J. et al.	2018	Carcinogenicity of glyphosate: why is New Zealand's EPA lost in the weeds?.	The New Zealand medical journal (2018), Vol. 131, No. 1472, pp. 82-89	Opinion article with no new data relevant to the renewal of glyphosate.
1333	Toxicology and metabolism	Dumukhalska Y. B. et al.	2018	Protective effect of the cisteile-histidile-tyrosile-histidile- isoleucine against heavy metal and glyfosate induced on content of lipid peroxidation products and reactive oxygen species in different age rats	Medichna ta Klinichna Khimiya (2018), No. 2, pp. 77-83	Administered a glyphosate based herbicide to rats for 30 days at 25% of acute oral LD50, this is not a representative way of exposure.
1334	Toxicology and metabolism	Eapen A. et al.	2018	Science, safety, and sanity: hot topics in food toxicology.	Journal of Food Protection (2018), Vol. 81, pp. 24	This paper did not mention glyphosate and is therefore not relevant.
1335	Toxicology and metabolism	Elhalwagy M. E. A. et al.	2014	Hepatoxicity induced by glyphosate-based herbicide baron in albino rats.	Journal of Animal and Veterinary Advances (2014), Vol. 13, No. 5, pp. 322-329	Formulation tested in vivo (Baron, 48% glyphosate, Egypt). As this is not the representative formulation, the article is not relevant to the renewal.
1336	Toxicology and metabolism	Elie-Caille C. et al.	2010	Morphological damages of a glyphosate-treated human keratinocyte cell line revealed by a micro- to nanoscale microscopic investigation.	Cell biology and toxicology (2010), Vol. 26, No. 4, pp. 331-9	This publication is considered not relevant for the risk assessment of glyphosate as the test concentrations used were in the range of 10-70 mM (all >> 1mM) and therefore considered physiologically irrelevant.
1337	Toxicology and metabolism	Emmanuel A. G. et al.	2015	Protective potential of betulinic acid against glyphosate-induced toxicity in testis and epididymis of male wistar rats	International Journal of Current Research (2015), Vol. 7, No. 6, pp. 16650-16660	Formulation tested in vivo (decribed as "commercial glyphosate"). As this is not the representative formulation, the article is not relevant to the renewal.
1338	Toxicology and metabolism	Erhunmwunse N. O. et al.	2014	Histopathological changes in the brain tissue of Africa catfish exposure to glyphosate herbicide.	Journal of Applied Sciences and Environmental Management (2014), Vol. 18, No. 2, pp. 275-280	Formulation tested (commercial formulation of glyphosate (360 g/l-41 w.wt IPA). As this is not the representative formulation, the article is not relevant to the renewal.
1339	Toxicology and metabolism	Fagan J. et al.	2015	The Seralini affair: degeneration of Science to Re-Science?	Environmental Sciences Europe (2015), Vol. 27, No. 19	Commentary from the Seralini paper retraction therefore not relevant to the renewal.
1340	Toxicology and metabolism	Faria M. A.	2015	Glyphosate, neurological diseases - and the scientific method	Surgical neurology international (2015), Vol. 6, pp. 132	A letter providing comments on Samsel and Seneff (ref 2324). Therefore not relevant for the risk assessment of glyphosate.
1341	Toxicology and metabolism	Feng P. et al.	2019	A review on gut remediation of selected environmental contaminants: Possible roles of probiotics and gut microbiota.	Nutrients (2019), Vol. 11, No. 1, pp. 22	A literature review on pollutants, probiotics and gut microbes therefore not relevant for the risk assessment of glyphosate.
1342	Toxicology and metabolism	Flandroy L. et al.	2018	The impact of human activities and lifestyles on the interlinked microbiota and health of humans and of ecosystems.	Science of the Total Environment (2018), Vol. 627, pp. 1018-1038	General discussion of microbiota and proposal for research prioritization therefore not relevant for the risk assessment of glyphosate.

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1343	Toxicology and metabolism	Fluegge K. et al.	2017	Exploring the potential confounder of nitrogen fertilizers in the relationship between pesticide exposures and risk of leukemia: a Poisson regression with two-way fixed-effects analysis	Chinese Journal of Cancer (2017), Vol. 36, No. 1, pp. 58	Letter to editor, focuses on nitrogen fertilizers and is therefore not relevant for the risk assessment of glyphosate.
1344	Toxicology and metabolism	Fluegge K. et al.	2017	Exposure to ambient PM10 and nitrogen dioxide and ADHD risk: A reply to Min & Min (2017).	Environment International (2017), Vol. 103, pp. 109-110	No new data, therefore not relevant for the risk assessment of glyphosate.
1345	Toxicology and metabolism	Fluegge K. R. et al.	2015	Glyphosate Use Predicts ADHD Hospital Discharges in the Healthcare Cost and Utilization Project Net (HCUPnet): A Two-Way Fixed-Effects Analysis.	PloS one (2015), Vol. 10, No. 8, pp. e0133525	Retracted publication, therefore not relevant for the risk assessment of glyphosate.
1346	Toxicology and metabolism	Ford B. et al.	2017	Mapping Proteome-wide Targets of Glyphosate in Mice.	Cell chemical biology (2017), Vol. 24, No. 2, pp. 133-140	This publication is considered not relevant because intraperitoneal injection was used which is an inappropriate route of administration for the occupational and food risk assessment of glyphosate.
1347	Toxicology and metabolism	Freddo N. et al.	2019	Isoflavone quantitation in soymilk: Genistein content and its biological effect.	CyTA-Journal of Food (2019), Vol. 17, No. 1, pp. 20-24	It mainly concerns the development of a bioanalytical method for the analysis of genistein and glyphosate in soya milk. The biological end-point selected (anxiety) and the test system used (elevated plus maze test) are not acceptable for regulatory use.
1348	Toxicology and metabolism	Frescura V. D. et al.	2013	Post-treatment with plant extracts used in Brazilian folk medicine caused a partial reversal of the antiproliferative effect of glyphosate in the Allium cepa test	Biocell (2013), Vol. 37, No. 2, pp. 23-8	Glyphosate used as an un-validated positive control in assay and is therefore not relevant for the risk assessment of glyphosate.
1349	Toxicology and metabolism	Fu H. et al.	2019	Toxicity of glyphosate in feed for weanling piglets and the mechanism of glyphosate detoxification by the liver nuclear receptor CAR/PXR pathway.	Journal of hazardous materials (2019), Vol. 387, pp. 121707	Glyphosate based herbicide dosed to weanling piglets. As this is not the representative formulation, the article is not relevant to the renewal.
1350	Toxicology and metabolism	Fuso A. et al.	2019	CpG and non-CpG methylation in the diet-epigenetics-neurodegeneration connection.	Current Nutrition Reports (2019), Vol. 8, No. 2, pp. 74-82	A review paper that mentions glyphosate once without any data. Therefore is not relevant for the risk assessment of glyphosate.
1351	Toxicology and metabolism	Gallegos C. E. et al.	2016	Exposure to a glyphosate-based herbicide during pregnancy and lactation induces neurobehavioral alterations in rat offspring.	Neurotoxicology (2016), Vol. 53, pp. 20-28	Formulation tested in vivo via drinking water (Glifloglex, 48% glyphosate, Gleba S.R.L., Argentina). As this is not the representative formulation, the article is not relevant to the renewal.
1352	Toxicology and metabolism	Gallegos C. E. et al.	2018	Perinatal Glyphosate-Based Herbicide Exposure in Rats Alters Brain Antioxidant Status, Glutamate and Acetylcholine Metabolism and Affects Recognition Memory.	Neurotoxicity research (2018), Vol. 34, No. 3, pp. 363-374	Formulation tested (in Argentina, Glifloglex® from Gleba S.R.L., 48 g isopropylamine salt per 100 cm3; 35.6% w/v a.e.). As this is not the representative formulation, the article is not relevant to the renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1353	Toxicology and metabolism	Gasnier C. et al.	2011	Defined plant extracts can protect human cells against combined xenobiotic effects.	Journal of occupational medicine and toxicology (2011), Vol. 6, No. 1, pp. 3	Protective mechanism of plant extracts upon various chemical exposure (RoundUp residues, Bisphenol A, Atrazine). As this is not the representative formulation, the article is not relevant to the renewal.
1354	Toxicology and metabolism	Gasnier C. et al.	2010	Dig1 protects against cell death provoked by glyphosate-based herbicides in human liver cell lines	Journal of Occupational Medicine and Toxicology (2010), Vol. 5, pp. 29-29	Protective mechanism of plant extracts upon various chemical exposure (RoundUp residues, Bisphenol A, Atrazine). As this is not the representative formulation, the article is not relevant to the renewal.
1355	Toxicology and metabolism	Gencer N. et al.	2011	In vitro effects of some pesticides on PON1Q192 and PON1R192 isoenzymes from human serum.	Fresenius Environmental Bulletin (2011), Vol. 20, No. 3, pp. 590-596	Test material identity is entirely missing and the claim presented is dubious: "The pesticides were of commercial origin, and at the highest available purity level (99%)." Therefore it is not relevant to the renewal of glyphosate.
1356	Toxicology and metabolism	Gentile N. et al.	2012	Micronucleus assay as a biomarker of genotoxicity in the occupational exposure to agrochemicals in rural workers	Bulletin of Environmental Contamination and Toxicology (2012), Vol. 88, No. 6, pp. 816-822	This paper does not contain glyphosate specific data and is therefore not relevant to the renewal of glpyohsate.
1357	Toxicology and metabolism	George J. et al.	2010	Studies on glyphosate-induced carcinogenicity in mouse skin: a proteomic approach.	Journal of proteomics (2010), Vol. 73, No. 5, pp. 951-64	The test material was a glyphosate-based formulation and not the reference formulation MON 52276. As this is not the representative formulation, the article is not relevant to the renewal.
1358	Toxicology and metabolism	George J. et al.	2013	Emptying of Intracellular Calcium Pool and Oxidative Stress Imbalance Are Associated with the Glyphosate-Induced Proliferation in Human Skin Keratinocytes HaCaT Cells.	ISRN dermatology (2013), Vol. 2013, pp. 825180	Formulation tested in vivo via dermal application (Roundup Original, 41% isopropylamine salt, 36% a.e.). Relevance of proteomic measurements not validated and as this is not the representative formulation, the article is not relevant to the renewal.
1359	Toxicology and metabolism	Gomez A. L. et al.	2019	Male mammary gland development and methylation status of estrogen receptor alpha in Wistar rats are modified by the developmental exposure to a glyphosate-based herbicide.	Molecular and cellular endocrinology (2019), Vol. 481, pp. 14-25	Formulation tested (Magnum Super II, Grupo Agros SA; 66.2% K salt, 54% a.e.). As this is not the representative formulation, the article is not relevant to the renewal.
1360	Toxicology and metabolism	Gomez-Arroyo S. et al.	2013	Assessing the genotoxic risk for Mexican children who are in residential proximity to agricultural areas with intense aerial pesticide applications	Revista Internacional de Contaminacion Ambiental (2013), Vol. 29, No. 3, pp. 217-225	This study does not present any glyphosate specific information and is therefore not relevant to the renewal.
1361	Toxicology and metabolism	Goussard P. et al.	2019	Corrosive injury of the trachea in children.	Clinical Case Reports (2019), Vol. 7, No. 10, pp. 1999-2003	One of the cases cited in the article swallowed an unknown amount of glyphosate formulation. No other mention of glyphosate. Focus of article on corrosion of trachea, not glyphosate and is therefore not relevant to the renewal
1362	Toxicology and metabolism	Gress S. et al.	2016	Dig1 protects against locomotor and biochemical dysfunctions provoked by Roundup.	BMC complementary and alternative medicine (2016), Vol. 16, pp. 234	Glyphosate based herbicide administered to rats in drinking water. As this is not the representative formulation, the article is not relevant to the renewal.

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1363	Toxicology and metabolism	Gress S. et al.	2015	Cardiotoxic Electrophysiological Effects of the Herbicide Roundup(®) in Rat and Rabbit Ventricular Myocardium In Vitro.	Cardiovascular toxicology (2015), Vol. 15, No. 4, pp. 324-35	Roundup Ultra formulation tested in vitro. As this is not the representative formulation, the article is not relevant to the renewal.
1364	Toxicology and metabolism	Guerrero Schimpf M. et al.	2018	Glyphosate-based herbicide enhances the uterine sensitivity to estradiol in rats.	The Journal of endocrinology (2018), Vol. 239, No. 2, pp 197-213	Non representative formulation tested instead of glyphosate. As this is not the representative formulation, the article is not relevant to the renewal.
1365	Toxicology and metabolism	Guerrero Schimpf M. et al.	2017	Neonatal exposure to a glyphosate based herbicide alters the development of the rat uterus.	Toxicology (2017), Vol. 376, pp. 2-14	Formulation tested in vivo via subcutaneous injection (Roundup FULL II, 66.2% potassium salt). As this is not the representative formulation, the article is not relevant to the renewal.
1366	Toxicology and metabolism	Guha N. et al.	2013	Characterization of residential pesticide use and chemical formulations through self-report and household inventory: The northern California childhood leukemia study.	Environmental Health Perspectives (2013), Vol. 121, No. 2, pp. 276-282	No data relevant to glyphosate human health effects and exposure to glyphosate therefore not relevant to the risk assessments.
1367	Toxicology and metabolism	Guilherme S. et al.	2012	DNA damage in fish (Anguilla anguilla) exposed to a glyphosate-based herbicide -- elucidation of organ-specificity and the role of oxidative stress.	Mutation research (2012), Vol. 743, No. 1-2, pp. 1-9	Glyphosate based herbicide tested in eels, surfactants present in the formulation are known to damage gills. As this is not the representative formulation, the article is not relevant to the renewal.
1368	Toxicology and metabolism	Guilherme S. et al.	2014	Are DNA-damaging effects induced by herbicide formulations (Roundup® and Garlon®) in fish transient and reversible upon cessation of exposure?.	Aquatic toxicology (2014), Vol. 155, pp. 213-21	Glyphosate based herbicide tested in aquatic species. As this is not the representative formulation, the article is not relevant to the renewal.
1369	Toxicology and metabolism	Gunatilake S. et al.	2019	Glyphosate's Synergistic Toxicity in Combination with Other Factors as a Cause of Chronic Kidney Disease of Unknown Origin.	International journal of environmental research and public health (2019), Vol. 16, No. 15	This publication is considered not relevant for the risk assessment of glyphosate because it does not present concrete epidemiological data on a possible association between chronic kidney disease and a synergistic effect of glyphosate with other environmental factors such as heavy metals.
1370	Toxicology and metabolism	Guyton K. Z. et al.	2015	Carcinogenicity of tetrachlorvinphos, parathion, malathion, diazinon, and glyphosate	Lancet Oncology (2015), Vol. 16, no. 5, pp. 490-491	This review is considered not relevant for the risk assessment of glyphosate because it does not contain a detailed report and discussion of experimental results. It only concerns a brief summary of the IARC evaluation of glyphosate which is not corroborated by regulatory agencies.
1371	Toxicology and metabolism	Halwachs S. et al.	2016	Assessment of ABCG2-mediated transport of pesticides across the rabbit placenta barrier using a novel MDCKII in vitro model.	Toxicology and applied pharmacology (2016), Vol. 305, pp. 66-74	No adverse effects, and therefore there is no relevance to the human health risk assessment.
1372	Toxicology and metabolism	Hamdaoui L. et al.	2016	Nephrotoxicity of Kalach 360 SL: biochemical and histopathological findings.	Toxicology mechanisms and methods (2016), Vol. 26, No. 9, pp. 685-691	Formulation tested (Kalach 360 SL) in vivo. As this is not the representative formulation, the article is not relevant to the renewal.
1373	Toxicology and metabolism	Hamdaoui L. et al.	2019	Sub-chronic exposure to Kalach 360 SL-induced damage in rats' liver and hematological system.	Environmental science and pollution research international (2019), Vol. 26, No. 36, pp. 36634-36646	Glyphosate based herbicide dosed to rats. As this is not the representative formulation, the article is not relevant to the renewal.

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1374	Toxicology and metabolism	Hamdaoui L. et al.	2018	Subchronic exposure to kalach 360 SL-induced endocrine disruption and ovary damage in female rats.	Archives of physiology and biochemistry (2018), Vol. 124, No. 1, pp. 27-34	Formulation tested (KL, Arysta Life Science, Fouchana Tunisia; isopropylamine salt 41.5%; surfactant, 15.5%). As this is not the representative formulation, the article is not relevant to the renewal.
1375	Toxicology and metabolism	Han J. et al.	2016	Determination of glyphosate and its metabolite in emergency room in Korea.	Forensic science international (2016), Vol. 265, pp. 41-6	Analytical method development in human blood therefore not relevant to the glyphosate risk assessment.
1376	Toxicology and metabolism	Hao Y. et al.	2019	Roundup confers cytotoxicity through DNA damage and Mitochondria-Associated apoptosis induction	Environmental Pollution (2019), Vol. 252, No. Part_A, pp. 917-923	This publication is considered not relevant for the risk assessment of glyphosate because a glyphosate formulation was tested in vitro instead of glyphosate.
1377	Toxicology and metabolism	Hao Y. et al.	2019	Evaluation of the cytotoxic effects of glyphosate herbicides in human liver, lung, and nerve	Journal of Environmental Science and Health, Part B Pesticides, Food Contaminants, and Agricultural Wastes (2019), Vol. 54, No. 9, pp. 737-744	This publication is considered not relevant for the risk assessment of glyphosate because glyphosate concentrations were tested in vitro that are physiologically not feasible in in vivo experimental models (> 1 mM).
1378	Toxicology and metabolism	Haskovic E. et al.	2016	Effects of Glyphosate on Enzyme Activity and Serum Glucose in Rats Rattus norvegicus	Acta veterinaria (2016), Vol. 66, No. 2, pp. 214-221	Only liver enzymes measured after 15 days dermal application of formulated product (Total 480 SL, Croatia), which is not a representative formulation fo the renewal.
1379	Toxicology and metabolism	Hendges C. et al.	2019	Human intoxication by agrochemicals in the region of South Brazil between 1999 and 2014.	Journal of Environmental Science and Health Part B Pesticides Food Contaminants and Agricultural Wastes (2019), Vol. 54, No. 4, pp. 219-225	This publication is considered not relevant for the risk assessment of glyphosate because it does not address specifically glyphosate exposure but pesticide poisoning in general.
1380	Toxicology and metabolism	Heritier L. et al.	2017	Oxidative stress induced by glyphosate-based herbicide on freshwater turtles.	Environmental toxicology and chemistry (2017), Vol. 36, No. 12, pp. 3343-3350	Glyphosate based herbicide tested on turtles. As this is not the representative formulation, the article is not relevant to the renewal.
1381	Toxicology and metabolism	Hernandez-Plata I. et al.	2015	The herbicide glyphosate causes behavioral changes and alterations in dopaminergic markers in male Sprague-Dawley rat.	Neurotoxicology (2015), Vol. 46, pp. 79-91	This publication is considered not relevant because of the use of intraperitoneal injection which is an inappropriate route of exposure for the occupational and food risk assessment of glyphosate.
1382	Toxicology and metabolism	Herrera-Valdes R. et al.	2019	Epidemic of chronic kidney disease of nontraditional etiology in El Salvador: Integrated health sector action and south-south cooperation.	MEDICC Review (2019), Vol. 21, No. 3, pp. 46-52	No data specific to glyphosate. Evaluated handling of agrochemicals as a risk factor, rather than individual pesticides.
1383	Toxicology and metabolism	Heu C. et al.	2012	Glyphosate-induced stiffening of HaCaT keratinocytes, a Peak Force Tapping study on living cells.	Journal of structural biology (2012), Vol. 178, No. 1, pp. 1-7	This publication is considered not relevant for the risk assessment of glyphosate because glyphosate concentrations have been used in vitro that cannot be attained in in vivo experimental models (> 1 mM).
1384	Toxicology and metabolism	Heu C. et al.	2012	A step further toward glyphosate-induced epidermal cell death: involvement of mitochondrial and oxidative mechanisms.	Environmental toxicology and pharmacology (2012), Vol. 34, No. 2, pp. 144-153	This publication is considered not relevant for the risk assessment of glyphosate because the cytotoxicity of glyphosate to epidermal cells was tested in the mM range whereas contact of epidermal cells to glyphosate formulations is always combined with surfactants which produce cytotoxicity in the sub-mM range.
1385	Toxicology and metabolism	Hofmann J. N. et al.	2015	The Biomarkers of Exposure and Effect in Agriculture (BEEA) Study: Rationale, Design, Methods, and Participant Characteristics	Journal of toxicology and environmental health. Part A (2015), Vol. 78, No. 21-22, pp. 1338-47	No endpoints for glyphosate, only relative use rates therefore cannot be used in the risk assessments.

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1386	Toxicology and metabolism	Hong S. et al.	2012	Cellular Toxicity of Surfactants Used as Herbicide Additives	JOURNAL OF KOREAN MEDICAL SCIENCE (2012), Vol. 27, No. 1, pp. 3-9	This study does not present any glyphosate specific information and cannot therefore be used in risk assessments.
1387	Toxicology and metabolism	Hong Y. et al.	2017	Effects of glyphosate on immune responses and haemocyte DNA damage of Chinese mitten crab, Eriocheir sinensis.	Fish & shellfish immunology (2017), Vol. 71, pp. 19-27	This paper discusses the effects of high doses of a glyphosate based herbicideto crabs. As this is not the representative formulation, the article is not relevant to the renewal.
1388	Toxicology and metabolism	Hsu C. et al.	2013	Can mortality from agricultural pesticide poisoning be predicted in the emergency department? Findings from a hospital-based study in eastern Taiwan	Tzu Chi Medical Journal (2013), Vol. 25, no. 1, pp. 32-38	This paper provides a retrospective analysis of poisoning incidents in Taiwan and is therefore not relevant to the renewal of glyphosate.
1389	Toxicology and metabolism	Hulin M. et al.	2014	Assessment of infant exposure to food chemicals: the French Total Diet Study design	Food Additives & Contaminants, Part A: Chemistry, Analysis, Control, Exposure & Risk Assessment (2014), Vol. 31, No. 7, pp. 1226-1239	This paper describes the assessment process of infant exposure to food chemicals. No glyphosate data was presented in the report, and is therefore not relevant to the renewal process.
1390	Toxicology and metabolism	Hussain R. et al.	2019	Exposure to Sub-Acute Concentrations of Glyphosate Induce Clinico-Hematological, Serum Biochemical and Genotoxic Damage in Adult Cockerels	PAKISTAN VETERINARY JOURNAL (2019), Vol. 39, No. 2, pp. 181-186	The glyphosate based herbicide used in the paper is not an EU representative formulation and is therefore not relevant to the renewal. Furthermore, the product was administered via gavage to avian species.
1391	Toxicology and metabolism	Hutter H. et al.	2018	Cytotoxic and Genotoxic Effects of Pesticide Exposure in Male Coffee Farmworkers of the Jarabacoa Region, Dominican Republic	INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH (2018), Vol. 15, No. 8	This study did not include any analyses specific for glyphosate, so it is not relevant.
1392	Toxicology and metabolism	IARC	2017	Some organophosphate insecticides and herbicides.	IARC Monographs on the Evaluation of Carcinogenic Risks to Humans (2017), Vol. 112, VII + pp. 452	This paper provides a secondary source of infomation and is therefore not relevant.
1393	Toxicology and metabolism	Ibrahim A. M. et al.	2019	Toxicological impact of butralin, glyphosate-isopropylammonium and pendimethalin herbicides on physiological parameters of Biomphalaria alexandrina snails	Molluscan research (2019), Vol. 39, No. 3, pp. 224-233	This paper describes an ecotoxicology study of snails exposed to a glyphosate based herbicide. As this is not the representative formulation, the article is not relevant to the renewal.
1394	Toxicology and metabolism	Ikpeme E. V. et al.	2012	Efficacy of ascorbic acid in reducing glyphosate-induced toxicity in rats.	British Biotechnology Journal (2012), Vol. 2, No. 3, pp. 157-168	The formulation tested in vivo is not described. It is not sure what was tested and therefore the effect cannot be attributed to glyphosate.
1395	Toxicology and metabolism	Ilyushina N. A. et al.	2019	Applicability of the Ames test and micronucleus test in vivo for the evaluation of the equivalence of pesticide technical grade active ingredients compared to original active substances	Gigiena i Sanitariya (2019), No. 2, pp. 219-224	Technical grade glyphosate was used as positive control in an assay within this paper. As this is not the representative formulation, the article is not relevant to the renewal.
1396	Toxicology and metabolism	Ingaramo P. I. et al.	2019	Acute uterine effects and long-term reproductive alterations in postnatally exposed female rats to a mixture of commercial formulations of endosulfan and glyphosate.	Food and chemical toxicology (2019), Vol. 134, pp. 110832	A glyphosate based herbicide was dosed to rats in this report. As this is not the representative formulation, the article is not relevant to the renewal.

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1397	Toxicology and metabolism	Ingaramo P. I. et al.	2017	Neonatal exposure to a glyphosate-based herbicide alters uterine decidualization in rats.	Reproductive toxicology (2017), Vol. 73, pp. 87-95	Formulation tested in vivo via sub-cutaneous injection (undisclosed brand, 66.2% potassium salt; 54% glyphosate acid). As this is not the representative formulation, the article is not relevant to the renewal.
1398	Toxicology and metabolism	Ingaramo P. I. et al.	2016	Effects of neonatal exposure to a glyphosate-based herbicide on female rat reproduction.	Reproduction (2016), Vol. 152, No. 5, pp. 403-15	A glyphosate based herbicide formulation was tested in vivo (66.2%, potassium salt). As this is not the representative formulation, the article is not relevant to the renewal.
1399	Toxicology and metabolism	Intranuovo G. et al.	2018	Assessment of DNA damages in lymphocytes of agricultural workers exposed to pesticides by comet assay in a cross-sectional study	Biomarkers (2018), Vol. 23, No. 5, pp. 462-473	General pesticide exposure evaluation, not glyphosate specific. Therefore this article is not relevant to the glyphosate renewal process.
1400	Toxicology and metabolism	Iummato M. M. et al.	2017	Effect of glyphosate acid on biochemical markers of periphyton exposed in outdoor mesocosms in the presence and absence of the mussel Limnoperna fortunei.	Environmental toxicology and chemistry (2017), Vol. 36, No. 7, pp. 1775-1784	The end-points described in this study are not relevant to human health risk assessments in the renewal.
1401	Toxicology and metabolism	Jayasumana C.	2019	Chronic Interstitial Nephritis in Agricultural Communities (CINAC) in Sri Lanka	SEMINARS IN NEPHROLOGY (2019), Vol. 39, No. 3, pp. 278-283	There is no evaluation of glyphosate exposure with any disease outcome presented in this paper. Therefore it is not relevant to the renewal.
1402	Toxicology and metabolism	Jayasumana C. et al.	2015	Drinking well water and occupational exposure to Herbicides is associated with chronic kidney disease, in Padavi-Sripura, Sri Lanka.	Environmental health (2015), Vol. 14, pp. 6	This study was performed in Sri Lanka and is therefore not relevant to the EU.
1403	Toxicology and metabolism	Jayasumana C. et al.	2015	Phosphate fertilizer is a main source of arsenic in areas affected with chronic kidney disease of unknown etiology in Sri Lanka.	SpringerPlus (2015), Vol. 4, pp. 90	No data on glyphosate is presented, and is therefore not relevant to the renewal dossier.
1404	Toxicology and metabolism	Ji H. et al.	2018	Differential microRNA expression in the prefrontal cortex of mouse offspring induced by glyphosate exposure during pregnancy and lactation.	Experimental and therapeutic medicine (2018), Vol. 15, No. 3, pp. 2457-2467	In this paper a glyphosate based formulation was tested, (purchased in China) and containing 48% IPA salt, and 35.6% a.e. Furthermore a glyphosate-based formulation (marketed in China) was used instead of glyphosate in an in vivo assay in mice with the end-points measured not suitable for risk assessment (differential microRNA expression in the prefrontal cortex).
1405	Toxicology and metabolism	Jiang X. et al.	2018	A commercial Roundup formulation induced male germ cell apoptosis by promoting the expression of XAF1 in adult mice	Toxicology Letters (2018), Vol. 296, pp. 163-172	In this study, a Roundup formulation was administered via gavage to adult male mice. As this is not the representative formulation, the article is not relevant to the renewal.
1406	Toxicology and metabolism	Kamata R. et al.	2018	Agonistic effects of diverse xenobiotics on the constitutive androstane receptor as detected in a recombinant yeast-cell assay	Toxicology In Vitro (2018), Vol. 46, pp. 335-349	This paper presents yeast cell assay validation. Glyphosate was not active in the test system and therefore this is not relevant for the renewal.
1407	Toxicology and metabolism	Kamel F. et al.	2012	Pesticide exposure and amyotrophic lateral sclerosis	NeuroToxicology (2012), Vol. 33, No. 3, pp. 457-462	This study does not present correlations of glyphosate use and effect and is not relevant to the renewal.

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1408	Toxicology and metabolism	Karthikraj R. et al.	2019	Widespread occurrence of glyphosate in urine from pet dogs and cats in New York State, USA.	The Science of the total environment (2019), Vol. 659, pp. 790-795	These data do not meet any data requirement under Regulation (EC) 1107/2009 and do not fit within any standard risk assessment under that regulation. The results indicate that exposure to glyphosate may be common in this limited population of companion animals, but at levels which do not raise toxicological concern.
1409	Toxicology and metabolism	Kawada T.	2018	Glyphosate toxicity and carcinogenicity.	EXCLI journal (2018), Vol. 17, pp. 800-801	Letter to editor citing other publications in this review, with no data discussed. Therefore not relevant to the renewal.
1410	Toxicology and metabolism	Khayat C. B. et al.	2013	Assessment of DNA damage in Brazilian workers occupationally exposed to pesticides: a study from Central Brazil.	Environmental Science and Pollution Research International (2013), Vol. 20, No. 10, pp. 7334-7340	No specific analyses was performed for glyphosate in this paper. Furthermore, uncertain sampling from an undefined population and adequate statistical analysis was carried out. No description of a case control study was provided, and the analysis did not evaluate a causal parameter for case control studies (e.g., an odds ratio) or address potential biases in the analysis. Therefore this study is not relevant to the renewal.
1411	Toxicology and metabolism	Kim S. et al.	2019	Pesticides as a risk factor for metabolic syndrome: Population-based longitudinal study in Korea	Molecular & Cellular Toxicology (2019), Vol. 15, No. 4, pp. 431-441	Epidemiology study on pesticide use in general. No information on specific pesticides used in the study was collected and is therefore not applicable to the renewal of glyphosate.
1412	Toxicology and metabolism	Kongtip P. et al.	2018	A cross-sectional investigation of cardiovascular and metabolic biomarkers among conventional and organic farmers in Thailand	International Journal of Environmental Research and Public Health (2018), Vol. 15, No. 11, pp. 2590	This paper presents an evalution of the effects of pesticide use in general on metabolic biomarkers. The results are not correlated to glyphosate use and cannot be used in glyphosate risk assessments.
1413	Toxicology and metabolism	Koutros S. et al.	2013	Genetic susceptibility loci, pesticide exposure and prostate cancer risk	PLoS One (2013), Vol. 8, No. 4, pp. e58195	This paper does not mention glyphosate and is not relevant.
1414	Toxicology and metabolism	Kubsad D. et al.	2019	Assessment of Glyphosate Induced Epigenetic Transgenerational Inheritance of Pathologies and Sperm Epimutations: Generational Toxicology	Scientific Reports (2019), Vol. 9, No. 1, pp. 1-17	This publication is considered not relevant because the intraperitoneal route of administration is not appropriate for the risk assessment of glyphosate.
1415	Toxicology and metabolism	Kumar V. et al.	2018	Interactions of Acephate, Glyphosate, Monocrotophos and Phorate with Bovine Serum Albumin.	Indian Journal of Pharmaceutical Sciences (2018), Vol. 80, No. 6, pp. 1151-1154	Study of binding to bovine serum albumin by several pesticides. No significant effect of glyphosate in this test system and is therefore not relevant for the risk assessment.
1416	Toxicology and metabolism	Kurenbach B. et al.	2017	Herbicide ingredients change Salmonella enterica sv. Typhimurium and Escherichia coli antibiotic responses.	Microbiology (2017), Vol. 163, pp. 1791-1801	This study describes the addition of high doses of herbicide ingredients to an in vitro system. The reason for the exclusion of in vitro testing of formulations to assess health effects as a result of systemic exposure is the presence of surfactants which produce cell toxicity based on the destabilization of the cell membrane and the mitochondrial membrane thus masking the specific toxicity of glyphosate.
1417	Toxicology and metabolism	Kwiatkowska M. et al.	2014	The effect of metabolites and impurities of glyphosate on human erythrocytes (in vitro).	Pesticide biochemistry and physiology (2014), Vol. 109, pp. 34-43	This publication is considered not relevant for the risk assessment of glyphosate because the in vitro concentrations used are in the mM range and the impurities were tested at the same concentrations as glyphosate which will never occur in practice.
1418	Toxicology and metabolism	Kwiatkowska M. et al.	2016	The Impact of Glyphosate, Its Metabolites and Impurities on	PloS one (2016), Vol. 11, No. 6, pp. e0156946	This publication is considered not relevant for the risk assessment of glyphosate because the in vitro concentrations

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				Viability, ATP Level and Morphological changes in Human Peripheral Blood Mononuclear Cells.		used are in the mM range and the impurities were tested at the same concentrations as glyphosate which will never occur in practice.
1419	Toxicology and metabolism	Lajmanovich R. C. et al.	2015	Harmful Effects of the Dermal Intake of Commercial Formulations Containing Chlorpyrifos, 2,4-D, and Glyphosate on the Common Toad Rhinella arenarum (Anura: Bufonidae).	Water Air and Soil Pollution (2015), Vol. 226, No. 12, pp. Article No.: 427	This study describes toad dermal exposure to a glyphosate based herbicide. Dermal uptake via moist toad skin was assessed and the end-points identified are not relevant to the human health risk assessment of glyphosate.
1420	Toxicology and metabolism	Landrigan P. J.	2018	Pesticides and Human Reproduction.	JAMA Internal Medicine (2018), Vol. 178, No. 1, pp. 26-27	No data provided in this paper as it is a commentary article. Cannot be used in a glyphosate risk assessment.
1421	Toxicology and metabolism	Larsen K. E. et al.	2016	The herbicide glyphosate is a weak inhibitor of acetylcholinesterase in rats.	Environmental toxicology and pharmacology (2016), Vol. 45, pp. 41-4	This publication is considered not relevant for the risk assessment of glyphosate because the concentrations used for in vitro testing were all in the mM range and not representative of in use conditions.
1422	Toxicology and metabolism	Larsson M. O. et al.	2018	Corrigendum to "Refined assessment and perspectives on the cumulative risk resulting from the dietary exposure to pesticide residues in the Danish population"[Food and Chemical Toxicology 111 (2018) 207-267] [Erratum to document cited in CA169:146371]	Food and Chemical Toxicology (2018), Vol. 113, pp. 345-346	Corrigendum to paper correcting calculations not pertaining to glyphosate. Therefore not relevant.
1423	Toxicology and metabolism	Lee H. M. et al.	2012	A case of activated charcoal aspiration treated by early and repeated bronchoalveolar lavage.	Tuberculosis and Respiratory Diseases (2012), Vol. 72, No. 2, pp. 177-181	Effects attributed to activated charcoal aspiration, not glyphosate. Therefore the paper is not relevant to the renewal.
1424	Toxicology and metabolism	Lee J-W. et al.	2015	Common Pesticides Used in Suicide Attempts Following the 2012 Paraquat Ban in Korea.	Journal of Korean medical science (2015), Vol. 30, No. 10, pp. 1517-21	Reports numbers of suicide attempts in South Korea, common pesticide use, not specifically referring to glyphosate.
1425	Toxicology and metabolism	Lermen J. et al.	2018	Pesticide exposure and health conditions among orange growers in Southern Brazil	Journal of Environmental Science and Health, Part B: Pesticides, Food Contaminants, and Agricultural Wastes (2018), Vol. 53, No. 4, pp. 215-221	This publication is not relevant for the risk assessment of glyphosate because the biological monitoring data were only used to address pesticide exposure in general and not glyphosate in particular.
1426	Toxicology and metabolism	Leveroni F. A. et al.	2017	Genotoxic response of blood, gill and liver cells of Piaractus mesopotamicus after an acute exposure to a glyphosate-based herbicide	Caryologia (2017), Vol. 70, No. 1, pp. 21-28	Formulation tested in aquatic species (Roundup Full II; 66.2% glyphosate potassium salt; CAS no. 70901-12-1). As this is not the representative formulation, the article is not relevant to the renewal.
1427	Toxicology and metabolism	Lewis M. M. et al.	2017	Lateralized basal ganglia vulnerability to pesticide exposure in asymptomatic agricultural workers	Toxicological Sciences (2017), Vol. 159, No. 1, pp. 170-178	The results presented are not correlated with exposure to glyphosate. Therefore this article is not relevant to the renewal of glyphosate.

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1428	Toxicology and metabolism	Leyva-Soto L. A. et al.	2018	GLYPHOSATE AND AMINOMETHYLPHOSPHONIC ACID IN POPULATION OF AGRICULTURAL FIELDS: HEALTH RISK ASSESSMENT OVERVIEW.	Applied Ecology and Environmental Research (2018), Vol. 16, No. 4, pp. 5127-5140	This paper is misrepresented as an epidemiologic cohort study. It is an informal community health risk survey with uncertain exposure assessment and uncertain health outcomes. The study population is poorly characterized. Uncertain temporal relationship between purported glyphosate drinking water exposure and disease outcome. The analysis was not appropriate for a cohort (or case control) study and is not relevant for glyphosate renewal.
1429	Toxicology and metabolism	Li M-H. et al.	2016	Multi-tissue metabolic responses of goldfish (Carassius auratus) exposed to glyphosate-based herbicide.	Toxicology Research (2016), Vol. 5, No. 4, pp. 1039-1052	This paper presents results of a glyphosate based herbicide tested on goldfish. The end-points defined are not relevant to the human health risk assessment for glyphosate renewal.
1430	Toxicology and metabolism	Li Q. et al.	2013	Glyphosate and AMPA inhibit cancer cell growth through inhibiting intracellular glycine synthesis.	Drug design, development and therapy (2013), Vol. 7, pp. 635-43	This paper described the theraputic applicactions of glyphosate and AMPA at very high in vitro doses to cancer cells. This is deemed not relevant to the glyphosate renewal.
1431	Toxicology and metabolism	Li Z.	2018	The use of a disability-adjusted life-year (DALY) metric to measure human health damage resulting from pesticide maximum legal exposures.	Science of the Total Environment (2018), Vol. 639, pp. 438-456	This publication is considered not relevant because it concerns the development of a uniform metric (the disability-adjusted life-year; DALY) in risk characterisation to express the human health impact of pesticide exposure and not experimental data that can be used for the risk assessment of glyphosate.
1432	Toxicology and metabolism	Litvinko N. M. et al.	2015	The effect of N-(phosphonomethyl)-glycine on phospholytic reaction catalyzed by phospholipase A2	Vestsi Natsyyanal'nai Akademii Navuk Belarusi, Seryya Khimichnykh Navuk (2015), Vol. 3, pp. 91-100	Unrealistic in vitro concentrations of ≥ 100 mg/mL were tested in the study. Therefore not relevant to the renewal of glyphosate.
1433	Toxicology and metabolism	Loomba R. S.	2016	Prevalence of isomerism from a European registry: Live births, fetal deaths, and terminations of pregnancy.	Congenital Anomalies (2016), Vol. 56, No. 6, pp. 256-257	This paper does not mention glyphosate or AMPA and is not relevant.
1434	Toxicology and metabolism	Lopez Gonzalez E. C. et al.	2013	Induction of micronuclei in broad snouted caiman (Caiman latirostris) hatchlings exposed in vivo to Roundup® (glyphosate) concentrations used in agriculture	Pesticide biochemistry and physiology (2013), Vol. 105, No. 2, pp. 131-134	The formulation tested in reptiles (Roundup, undefined, uncharacterized) is not the representative formulation, and therefore the article is not relevant to the renewal.
1435	Toxicology and metabolism	Lorenz V. et al.	2019	Epigenetic disruption of estrogen receptor alpha is induced by a glyphosate-based herbicide in the preimplantation uterus of rats.	Molecular and cellular endocrinology (2019), Vol. 480, pp. 133-141	Formulation tested (MAGNUM SUPER II) marketed in Argentina by Grupo Agros S.R.L. and comprises 66.2% potassium salt and 54% w/v a.e. As this is not the representative formulation, the article is not relevant to the renewal.
1436	Toxicology and metabolism	Loro V. L. et al.	2015	Glyphosate-based herbicide affects biochemical parameters in Rhamdia quelen (Quoy & Gaimard, 1824 and) Leporinus obtusidens (Valenciennes, 1837).	Neotropical Ichthyology (2015), Vol. 13, No. 1, pp. 229-235	This study describes the application of high aquatic doses of glyphosate based herbicide with observed effects attributable to the surfactant present in the formulation. As this is not the representative formulation, the article is not relevant to the renewal.
1437	Toxicology and metabolism	Luaces J. P. et al.	2017	Genotoxic effects of Roundup Full II® on lymphocytes of Chaetophractus villosus (Xenarthra, Mammalia): In vitro studies.	PloS one (2017), Vol. 12, No. 8, pp. e0182911	Formulation tested in vivo (Roundup Full II, containing 66.2% glyphosate, Argentina). As this is not the representative formulation, the article is not relevant to the renewal.

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1438	Toxicology and metabolism	Luo L. et al.	2017	In vitro cytotoxicity assessment of roundup (glyphosate) in L-02 hepatocytes.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes (2017), Vol. 52, No. 6, pp. 410-417	Formulation tested in vitro (Roundup, containing 41% isopropylamine salt; Belgium). The effects observed are due to high dosing of the surfactant in vitro, and as this is not the representative formulation, the article is not relevant to the renewal.
1439	Toxicology and metabolism	Mahakhode R. H. et al.	2013	Mitotic abnormalities induced by glyphosate in Psoralea corylifolia L..	International Journal of Current Pharmaceutical Research (2013), Vol. 5, No. 1, pp. 46-48	Tested a plant species with a herbicide for adverse end-points; the identified end-points are not relevant to human health and the renewal.
1440	Toxicology and metabolism	Malagoli C. et al.	2016	Passive exposure to agricultural pesticides and risk of childhood leukemia in an Italian community.	International journal of hygiene and environmental health (2016), Vol. 219, No. 8, pp. 742-748	This study did not perform any specific analyses for glyphosate. Furthermore, there was a very small case control study with a speculative exposure variable. This is not relevant for the renewal of glyphosate.
1441	Toxicology and metabolism	Mao Y. et al.	2015	Effect of glyphosate on serum biochemical indices of exposed workers	Zhongguo Gongye Yixue Zazhi (2015), Vol. 28, No. 5, pp. 362-364	The worker protections and manufacturing processes in China do not reflect Western occupational exposure scenarios. Therefore this is not relevant to glyphosate renewal.
1442	Toxicology and metabolism	Marcoccia D. et al.	2017	Food components and contaminants as (anti)androgenic molecules.	Genes and Nutrition (2017), Vol. 12, No. 1 pp. 6	This paper discusses some glyphosate literature, but does not provide new data. Therefore it cannot be used in the glyphosate risk assessments.
1443	Toxicology and metabolism	Marques A. et al.	2014	Progression of DNA damage induced by a glyphosate-based herbicide in fish (Anguilla anguilla) upon exposure and post-exposure periods--insights into the mechanisms of genotoxicity and DNA repair.	Comparative biochemistry and physiology. Toxicology & pharmacology (2014), Vol. 166, pp. 126-33	This study outlines the test of a glyphosate based herbicide to aquatic species. As this is not the representative formulation, the article is not relevant to the renewal.
1444	Toxicology and metabolism	Martinez M. et al.	2019	Use of human neuroblastoma SH-SY5Y cells to evaluate glyphosate-induced effects on oxidative stress, neuronal development and cell death signaling pathways.	Environment international (2019), Vol. 135, pp. 105414	This publication is considered not relevant for the risk assessment of glyphosate and AMPA as the concentrations used for the measurement of oxidative stress and apoptosis were beyond the physiologically acceptable range of 1 mM (5 and 10 mM).
1445	Toxicology and metabolism	Martini C. N. et al.	2012	A commercial formulation of glyphosate inhibits proliferation and differentiation to adipocytes and induces apoptosis in 3T3-L1 fibroblasts.	Toxicology in vitro (2012), Vol. 26, No. 6, pp. 1007-13	The formulation tested in vitro (commercial glyphosate formulation; 48% w/v, isopropylamine salt,from Atanor, Argentina) is not the representative formulation, and thus the article is not relevant to the renewal.
1446	Toxicology and metabolism	Martini C. N. et al.	2016	Glyphosate Inhibits PPAR Gamma Induction and Differentiation of Preadipocytes and is able to Induce Oxidative Stress.	Journal of biochemical and molecular toxicology (2016), Vol. 30, No. 8, pp. 404-13	Formulation tested in vitro at a single high dose in the mM range (Glifosato Atanor, containing 48% isopropylamine salt, 35.6% glyphosate, Argentina). As this is not the representative formulation, the article is not relevant to the renewal.
1447	Toxicology and metabolism	Martini C. N. et al.	2016	Glyphosate-based herbicides with different adjuvants are more potent inhibitors of 3T3-L1 fibroblast proliferation and differentiation to adipocytes than glyphosate alone.	Comparative Clinical Pathology (2016), Vol. 25, No. 3, pp. 607-613	In this paper, three glyphosate-based herbicides with different adjuvants were tested in vitro. Glyphosate only effects were noted only at excessively high doses > 20mM, this is physiologically not possible to attain in standard regulatory in vivo testing

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1448	Toxicology and metabolism	Marx-Stoelting P. et al.	2014	Assessment of three approaches for regulatory decision making on pesticides with endocrine disrupting properties	Regulatory Toxicology and Pharmacology (2014), Vol. 70, No. 3, pp. 590-604	No glyphosate specific information was presented in this paper and therefore this article is not relevant to the renewal.
1449	Toxicology and metabolism	Mesnage R. et al.	2013	Cytotoxicity on human cells of Cry1Ab and Cry1Ac Bt insecticidal toxins alone or with a glyphosate-based herbicide.	Journal of applied toxicology (2013), Vol. 33, No. 7, pp. 695-9	Not only was the glyphosate based herbicide formulation tested together with other substances (Roundup GT Plus containing 450 g/L glyphosate), this is not the representative formulation, the article is not relevant to the renewal.
1450	Toxicology and metabolism	Mesnage R. et al.	2015	Transcriptome profile analysis reflects rat liver and kidney damage following chronic ultra-low dose Roundup exposure.	Environmental health (2015), Vol. 14, article No. 70	Formulation tested (Grand Travaux Plus (450 g/L, Belgium) for non-validated endpoints therefore cannot be used in an EU Annex I renewal.
1451	Toxicology and metabolism	Mesnage R. et al.	2018	Multiomics reveal non-alcoholic fatty liver disease in rats following chronic exposure to an ultra-low dose of Roundup herbicide (vol 7, 39328, 2017).	Scientific Reports (2018), Vol. 8, pp. Article No.: 12572	The Roundup formulation tested in rats is not the representative formulation, and the article is not relevant to the renewal.
1452	Toxicology and metabolism	Meyer-Monath M. et al.	2014	Development of a multi-residue method in a fetal matrix: analysis of meconium	Analytical and Bioanalytical Chemistry (2014), Vol. 406, No. 30, pp. 7785-7797	This is primarily an analytical method paper for determination of multiple analytes (including glyphosate) in meconium. Actual meconium samples were analyzed. Minimal details of results provided, and no detections of glyphosate reported, therefore the report is not relevant.
1453	Toxicology and metabolism	Moreno N. C. et al.	2014	Genotoxic effects of the herbicide Roundup Transorb and its active ingredient glyphosate on the fish Prochilodus lineatus.	Environmental toxicology and pharmacology (2014), Vol. 37, No. 1, pp. 448-54	Formulation tested (Roundup Transorb® containing480 g glyphosate /L, Monsanto Brazil Ltd). As this is not the representative formulation, and the article is not relevant to the renewal.
1454	Toxicology and metabolism	Morley W. A. et al.	2014	Diminished brain resilience syndrome: A modern day neurological pathology of increased susceptibility to mild brain trauma, concussion, and downstream neurodegeneration.	Surgical neurology international (2014), Vol. 5, pp. 97	Many hypotheses are discussed in this studywith no data presented that could be used in a renewal dossier.
1455	Toxicology and metabolism	Moshammer H. et al.	2019	Validity of reported indicators of pesticide exposure and relevance for cytotoxic and genotoxic effects on buccal cells.	Mutagenesis (2019), Vol. 34, No. 2, pp. 147-152	This publication is considered not relevant for the risk assessment of glyphosate as the association between pesticide use in general and genotoxicity and cytotoxicity markers in buccal cells was studied only, and not specifically glyphosate.
1456	Toxicology and metabolism	Murussi C. et al.	2014	Changes in oxidative markers, endogenous antioxidants and activity of the enzyme acetylcholinesterase in farmers exposed to agricultural pesticides - a pilot study	Ciencia Rural (2014), Vol. 44, No. 7, pp. 1186-1193	This pilot study evaluated the use of general pesticides only with a comparison between treated and non-treated. Glyphosate alone was not evaluated and as a result this study cannot be used in the renewal dossier.
1457	Toxicology and metabolism	Mwabulambo S. G. et al.	2018	Health symptoms associated with pesticides exposure among flower and onion pesticide applicators in Arusha region.	Annals of Global Health (2018), Vol. 84, No. 3, pp. 369-379	This document describes the use of PPE during general occupational pesticide use and is not relevant to the glyphosate renewal dossier.

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1458	Toxicology and metabolism	Nagy K. et al.	2020	Systematic review of comparative studies assessing the toxicity of pesticide active ingredients and their product formulations.	Environmental research (2020), Vol. 181, pp. 108926	This is a review paper with no new data presented. Therefore is not relevant to the glyphosate risk assessments.
1459	Toxicology and metabolism	Nardi J. et al.	2017	Prepubertal subchronic exposure to soy milk and glyphosate leads to endocrine disruption.	Food and chemical toxicology (2017), Vol. 100, pp. 247-252	A paper describing a glyphosate formulation co-dosed with phytoestrogen. As this is a mixture the effects cannot be determined for glyphosate alone and thus the paper is not relevant for the renewal dossier.
1460	Toxicology and metabolism	Naz S. et al.	2019	Effect of glyphosate on hematological and biochemical parameters of Rabbit (Oryctolagus cuniculus)	Pure and Applied Biology (2019), Vol. 8, No. 1, pp. 78-92	Rabbits gavaged with a glyphosate based herbicide(Glyphosate comprised 48% of the formulation with another 48% glyphosate IPA (isopropylammonium) salt) sourced in Pakistan. As this is not the representative formulation, and the article is not relevant to the renewal.
1461	Toxicology and metabolism	Negga R. et al.	2012	Exposure to glyphosate- and/or Mn/Zn-ethylene-bis-dithiocarbamate-containing pesticides leads to degeneration of γ-aminobutyric acid and dopamine neurons in Caenorhabditis elegans.	Neurotoxicity research (2012), Vol. 21, No. 3, pp. 281-90	This study describes invertebrate tests performed using a glyphosate based herbicide. As this is not the representative formulation, and the article is not relevant to the renewal.
1462	Toxicology and metabolism	Nippanon P. et al.	2019	Chemical pesticide use and quality of life of rubber farmers in the Northeast of Thailand.	Kathmandu University Medical Journal (2019), Vol. 17, No. 65	A paper evaluating the handling of agrochemicals as a risk factor, rather than individual pesticides. Similarly, only the percentage of farmers using glyphosate was reported.
1463	Toxicology and metabolism	Nishiyori Y. et al.	2014	Unilateral hippocampal infarction associated with an attempted suicide: a case report.	Journal of medical case reports (2014), Vol. 8, pp. 219	Glyphosate does not cross the blood brain barrier and does not cause neurotoxicity. Nor would it be expected that glyphosate ingestion unilaterally targets the dorsal part of the left hippocampus. This presentation is much more consistent with a small vessel embolic event and the patient should have been evaluated for risk factors for stroke such as atrial fibrillation or carotid atherosclerosis. Not relevant for the risk assessment.
1464	Toxicology and metabolism	Nobels I. et al.	2011	Toxicity Ranking and Toxic Mode of Action Evaluation of Commonly Used Agricultural Adjuvants on the Basis of Bacterial Gene Expression Profiles	PLOS ONE (2011), Vol. 6, No. 11, pp. E24139	A study on commonly used adjuvants and solvents in pesticide formulations, however no glyphosate or Roundup specific data is mentioned therefore the study is not relevant for the renewal dossier.
1465	Toxicology and metabolism	Norskov N. P. et al.	2019	Robust and highly sensitive micro liquid chromatography-tandem mass spectrometry method for analyses of polar pesticides (glyphosate, aminomethylphosfonic acid, N-acetyl glyphosate and N-acetyl aminomethylphosfonic acid) in multiple biological matrices.	Journal of chromatography. A (2019), Vol. 1605, pp. 360343	This paper concerns development of a glyphosate assay and is likely a precursor to a gut microbe study. No animal data and no information relevant for the risk assessment were presented.
1466	Toxicology and metabolism	Nur G. et al.	2018	Histopathological and biochemical responses to the oxidative stress induced by glyphosate-based herbicides in the rainbow trout (Oncorhynchus mykiss)	Journal of Cellular Neuroscience and Oxidative Stress (2018), Vol. 10, No. 1, pp. 656-665	A glyphosate based herbicidewas tested in aquatic species, without positive control to verify validity of the assay. Gill damage is directly attributable to the surfactant present in the formulation, with oxidative stress a consequence of cell damage.

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1467	Toxicology and metabolism	Nwani C. D. et al.	2014	Induction of micronuclei and nuclear lesions in Channa punctatus following exposure to carbosulfan, glyphosate and atrazine.	Drug and chemical toxicology (2014), Vol. 37, No. 4, pp. 370-7	A glyphosate based herbicide (Roundup SL; India; 41% soluble liquid) was tested in aquatic species. This study discusses cellular and molecular level end-points that are not relevant to an EU level ecotoxicology risk assessment.
1468	Toxicology and metabolism	Owrang I. et al.	2013	Antioxidant effect of ginger on the pituitary-gonadal axis hormones recovered from the devastating effects of the herbicide Glyphosate in female rats	International Journal of Biology, Pharmacy and Allied Sciences (2013), Vol. 2, No. 8, pp. 1606-1616	Dosing via i.p. injection daily for three weeks is not relevant. The glyphosate source is not described at all. It is not clear whether this study dosed a glyphosate based herbicide, a technical acid or salt.
1469	Toxicology and metabolism	Pandey A. et al.	2019	Inflammatory Effects of Subacute Exposure of Roundup in Rat Liver and Adipose Tissue.	Dose-response (2019), Vol. 17, No. 2, pp. 1	The formulation tested in this study (Herbicide Roundup, 41% w/w glyphosate, Monsanto India Ltd, Mumbai, India) is not the representative formulation and is not relevant to the renewal.
1470	Toxicology and metabolism	Parajuli K. R. et al.	2015	Aminomethylphosphonic acid and methoxyacetic acid induce apoptosis in prostate cancer cells.	International journal of molecular sciences (2015), Vol. 16, No. 5, pp. 11750-65	In this study the therapeutic use of AMPA was evaluated rather than glyphosate. Therefore it is not relevant to the renewal.
1471	Toxicology and metabolism	Parajuli K. R. et al.	2016	Aminomethylphosphonic acid inhibits growth and metastasis of human prostate cancer in an orthotopic xenograft mouse model.	Oncotarget (2016), Vol. 7, No. 9, pp. 10616-26	In this study the therapeutic use of AMPA was evaluated rather than glyphosate. Therefore it is not relevant to the renewal.
1472	Toxicology and metabolism	Paumgartten F. J. R.	2019	Comment on 'Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats', Arch Toxicol 92:2629-2643 : On the impairment of female reproductive performance by developm	Archives of toxicology (2019), Vol. 93, No. 3, pp. 831-832	Letter refers to a previous paper published by Milesi et al (Perinatal exposure to a glyphosate-based herbicide impairs.; Arch Toxicol 2018, 92(8):2629–2643.): Milesi et al is not in Marian's LRR2 list.
1473	Toxicology and metabolism	Perego M. C. et al.	2017	Influence of a Roundup formulation on glyphosate effects on steroidogenesis and proliferation of bovine granulosa cells in vitro.	Chemosphere (2017), Vol. 188, pp. 274-279	This study examines the in vitro formulation effects only, rather than glyphosate alone.
1474	Toxicology and metabolism	Perez-Torres I. et al.	2017	Beneficial Effects of the Amino Acid Glycine.	Mini reviews in medicinal chemistry (2017), Vol. 17, No. 1, pp. 15-32	This paper does not contain any data pertaining to glyphosate and is therefore not relevant.
1475	Toxicology and metabolism	Peters C. E. et al.	2018	Priority Setting for Occupational Cancer Prevention.	Safety and Health at Work (2018), Vol. 9, No. 2, pp. 133-139	This paper does not contain any data pertaining to glyphosate and is therefore not relevant
1476	Toxicology and metabolism	Portier C. J. et al.	2016	Differences in the carcinogenic evaluation of glyphosate between the International Agency for Research on Cancer (IARC) and the European Food Safety Authority (EFSA).	Journal of epidemiology and community health (2016), Vol. 70, No. 8, pp. 741-5	This publication is considered not relevant because it is not based on experimental data.
1477	Toxicology and metabolism	Pouokam G. B. et al.	2017	A Pilot Study in Cameroon to Understand Safe Uses of Pesticides in Agriculture, Risk Factors for Farmers' Exposure and Management of Accidental Cases.	Toxics (2017), Vol. 5, No. 4	This paper does not contain any data pertaining to glyphosate and is therefore not relevant.

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1478	Toxicology and metabolism	Qiu S. et al.	2020	Toxic effects of glyphosate on intestinal morphology, antioxidant capacity and barrier function in weaned piglets.	Ecotoxicology and environmental safety (2020), Vol. 187, pp. 109846	This study investigates glyphosate based herbicides dosed to piglets. As this is not the representative formulation, and the article is not relevant to the renewal.
1479	Toxicology and metabolism	Ramsden J. J.	2017	Assaults on health.	Journal of Biological Physics and Chemistry (2017), Vol. 17, No. 1, pp. 3-7	Commentary on various threats to human health and not directly relevant to the renewal.
1480	Toxicology and metabolism	Rappazzo K. M. et al.	2019	Maternal residential exposure to specific agricultural pesticide active ingredients and birth defects in a 2003-2005 North Carolina birth cohort.	Birth defects research (2019), Vol. 111, No. 6, pp. 312-323	Highly speculative exposure assessment limited to pesticides makes it impossible to adequately assess results. Therefore this study is not relevant.
1481	Toxicology and metabolism	Robert J. R. et al.	2013	Council on Environmental Health. Technical Report: Pesticide Exposure in Children (vol 130, pg e1765, 2012).	Pediatrics (2013), Vol. 131, No. 5, pp. 1013-1014	This paper does not contain any data pertaining to glyphosate and is therefore not relevant.
1482	Toxicology and metabolism	Rojas Garcia A. E. et al.	2018	Special issue on pesticide contamination and toxicology. Numero especial: Contaminacion y toxicologia por plaguicidas	Revista Internacional de Contaminacion Ambiental (2018), Vol. 34, pp. 7-105	A special issue with seven articles that were either reviews discussing glyphosate, or notrelevant to glyphosate.
1483	Toxicology and metabolism	Romano M. A. et al.	2012	Glyphosate impairs male offspring reproductive development by disrupting gonadotropin expression.	Archives of toxicology (2012), Vol. 86, No. 4, pp. 663-73	This publication is considered not relevant for the risk assessment of glyphosate as a glyphosate based herbicide (Roundup Transorb) has been tested instead of glyphosate.
1484	Toxicology and metabolism	Romano M. A. et al.	2012	Reply to comment of John M. DeSesso and Amy L. Williams regarding "Glyphosate impairs male offspring reproductive development by disrupting gonadotropin expression" by Romano et al. 2012	Archives of Toxicology (2012), Vol. 86, No. 11, pp. 1795-1797	This article reflects the categorization of the original article which was classified as not relevant.
1485	Toxicology and metabolism	Romano R. M. et al.	2010	Prepubertal exposure to commercial formulation of the herbicide glyphosate alters testosterone levels and testicular morphology.	Archives of toxicology (2010), Vol. 84, No. 4, pp. 309-17	The test material was a glyphosate-based formulation and not the reference formulation MON 52276 and is therefore not relevant
1486	Toxicology and metabolism	Roongruangchai J. et al.	2018	The teratogenic effects of glyphosate based herbicide (GBH) on the development of chick embryos.	Siriraj Medical Journal (2018), Vol. 70, No. 5, pp. 419-428	This report studies the injection of glyphosate based fertilisers into fertilized chicken eggs. As this is not the representative formulation, athe article is not relevant to the renewal.
1487	Toxicology and metabolism	Salaroli L. et al.	2019	Occupational Exposure to Agrochemicals, Risks and Safety Practices in Family Agriculture in a Municipality of the State of Espirito Santo, Brazil (P04-077-19).	Current developments in nutrition (2019), Vol. 3, No. Suppl 1, pp. 259	General pesticide review of occupational exposures and safety practices and not relevant for the renewal.
1488	Toxicology and metabolism	Samsel A. et al.	2013	Glyphosate, pathways to modern diseases II: Celiac sprue and gluten intolerance.	Interdisciplinary toxicology (2013), Vol. 6, No. 4, pp. 159-84	This publication is considered not relevant for the risk assessment of glyphosate because it is not based on experimental work and no epidemiologic methodology was followed.
1489	Toxicology and metabolism	Samsel A. et al.	2015	Glyphosate, pathways to modern diseases III: Manganese, neurological diseases, and associated pathologies.	Surgical neurology international (2015), Vol. 6, pp. 45	This publication is considered not relevant for the risk assessment of glyphosate because it is not based on experimental work and no epidemiologic methodology was followed.

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1490	Toxicology and metabolism	Samsel A. et al.	2013	Glyphosate's suppression of cytochrome P450 enzymes and amino acid biosynthesis by the gut microbiome: pathways to modern diseases	Entropy (2013), Vol. 15, pp. 1416-1463	This publication is considered not relevant for the risk assessment of glyphosate because it is not based on experimental work and no epidemiologic methodology was followed.
1491	Toxicology and metabolism	Samsel A. et al.	2015	Glyphosate, pathways to modern diseases IV: cancer and related pathologies.	Journal of Biological Physics and Chemistry (2015), Vol. 15, No. 3, pp. 121-159	This publication is considered not relevant for the risk assessment of glyphosate because it is not based on experimental work and no epidemiologic methodology was followed.
1492	Toxicology and metabolism	Samsel A. et al.	2016	Glyphosate pathways to modern diseases V: Amino acid analogue of glycine in diverse proteins.	Journal of Biological Physics and Chemistry (2016), Vol. 16, No. 1, pp. 9-46	This publication is considered not relevant for the risk assessment of glyphosate because it is not based on experimental work and no epidemiologic methodology was followed.
1493	Toxicology and metabolism	Samsel A. et al.	2017	Glyphosate pathways to modern diseases VI: Prions, amyloidoses and autoimmune neurological diseases.	Journal of Biological Physics and Chemistry (2017), Vol. 17, No. 1, pp. 8-32	This publication is considered not relevant for the risk assessment of glyphosate because it is not based on experimental work and no epidemiologic methodology was followed.
1494	Toxicology and metabolism	Scammell M. K. et al.	2019	Environmental and Occupational Exposures in Kidney Disease.	Seminars in Nephrology (2019), Vol. 39, No. 3, pp. 230-243	This paper does not contain any new data pertaining to glyphosate and is therefore not relevant.
1495	Toxicology and metabolism	Schaumburg L. G. et al.	2016	Genotoxicity induced by Roundup® (Glyphosate) in tegu lizard (Salvator merianae) embryos.	Pesticide biochemistry and physiology (2016), Vol. 130, pp. 71-78	A glyphosate based herbicide was tested in lizard eggs. As this was not the representative formulation the article is not relevant to the renewal.
1496	Toxicology and metabolism	Seneff S. et al.	2015	Death as a drug side effect in FAERS: is glyphosate contamination a factor?	Agricultural Sciences (2015), Vol. 6, No. 12, pp. 1472-1501	Within this report, hypotheses are discussed without any empirical data. Therefore it is not relevant to the renewal.
1497	Toxicology and metabolism	Seneff S. et al.	2015	Aluminum and glyphosate can synergistically induce pineal gland pathology: connection to gut dysbiosis and neurological disease.	Agricultural Sciences (2015), Vol. 6, No. 1, pp. 42-70	This paper is not relevant as it is not based on experimental work and no epidemiologic methodology was followed. Conclusion (glyphosate and aluminium, operate synergistically to induce dysfunction in the pineal gland leading to the sleep disorder that is characteristic of multiple neurological diseases, including autism, ADHD, depression, Alzheimer’s disease, ALS, anxiety disorder and Parkinson’s disease) is pure speculation and is not corroborated by current experimental data.
1498	Toxicology and metabolism	Seneff S. et al.	2017	Can glyphosate's disruption of the gut microbiome and induction of sulfate deficiency explain the epidemic in gout and associated diseases in the industrialized world?.	Journal of Biological Physics and Chemistry (2017), Vol. 17, No. 2, pp. 53-76	Study is not relevant as it is not based on experimental work and no epidemiologic methodology was followed. Results and proposed mode of actions are speculation without any experimental proof.
1499	Toxicology and metabolism	Seneff S. et al.	2013	Is encephalopathy a mechanism to renew sulfate in autism?	Entropy (2013), Vol. 15, pp. 372-406	This paper presents hypotheses without data and is not relevant.
1500	Toxicology and metabolism	Seralini G. E.	2015	Why glyphosate is not the issue with Roundup A short overview of 30 years of our research.	Journal of Biological Physics and Chemistry (2015), Vol. 15, No. 3, pp. 111-119	A review of glyphosate vs formulations. Secondary source of information, not experimental data presented.
1501	Toxicology and metabolism	Seralini G. E. et al.	2014	Conclusiveness of toxicity data and double standards	FOOD AND CHEMICAL TOXICOLOGY (2014), Vol. 69, pp. 357-359	This is a commentary of a Seralini paper retraction and not relevant.
1502	Toxicology and metabolism	Seralini G. E. et al.	2014	Conflicts of interests, confidentiality and censorship in health risk assessment: the example of an herbicide and a GMO.	Environmental Sciences Europe (2014), Vol. 26, No. 13, pp. 1	This is a commentary article and not relevant.

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1503	Toxicology and metabolism	Seralini G. et al.	2012	Long term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize.	Food and chemical toxicology (2012), Vol. 50, No. 11, pp. 4221-31	This paper is a retraction announcement from the journal publishers and not relevant.
1504	Toxicology and metabolism	Seralini G. et al.	2014	Republished study: long-term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize.	Environmental sciences Europe (2014), Vol. 26, No. 1, pp. 14	This publication is considered not relevant for risk assessment of glyphosate because a glyphosate formulation was used instead of glyphosate.
1505	Toxicology and metabolism	Siddiqui S. et al.	2012	Glyphosate, alachor and maleic hydrazide have genotoxic effect on Trigonella foenum-graecum L	Bulletin of environmental contamination and toxicology (2012), Vol. 88, No. 5, pp. 659-65	Not valid to evaluate genotoxicity of herbicides on the plant species tested.
1506	Toxicology and metabolism	Soudani N. et al.	2019	Glyphosate disrupts redox status and up-regulates metallothionein I and II genes expression in the liver of adult rats. Alleviation by quercetin.	General physiology and biophysics (2019), Vol. 38, No. 2, pp. 123-134	This publication is considered not relevant for the risk assessment of glyphosate because the route of administration used was not appropriate (intraperitoneal injection).
1507	Toxicology and metabolism	Stur E. et al.	2019	Glyphosate-based herbicides at low doses affect canonical pathways in estrogen positive and negative breast cancer cell lines.	PloS one (2019), Vol. 14, No. 7, pp. e0219610	This publication is considered not relevant for the risk assessment of glyphosate as the concentration of AMPA used (10 mM) is beyond the physiologically acceptable range (> 1 mM). Evaluation of a glyphosate-based herbicide in in vitro systems is not relevant to the risk assessment of glyphosate due to the effects of surfactants on cells.
1508	Toxicology and metabolism	Swanson N. L. et al.	2014	Genetically engineered crops, glyphosate and the deterioration of health in the United States of America.	Journal of Organic Systems (2014), Vol. 9, No. 2, pp. 6-37	This publication is considered not relevant for the risk assessment of glyphosate as no epidemiological approach was followed to establish an association between exposure to glyphosate and disease outcome.
1509	Toxicology and metabolism	Szabo R. et al.	2017	Studies on joint toxic effects of a glyphosate herbicide (Fozat 480) and a heavy metal (cadmium) on chicken embryos.	AGROFOR International Journal (2017), Vol. 2, No. 3, pp. 37-43	Glyphosate based herbicide applied to fertilized chicken eggs, is not the representative formulation and not relevant to human health risk assessment.
1510	Toxicology and metabolism	Szemeredy G. et al.	2016	TOXICITY TEST OF INDIVIDUAL AND COMBINED TOXIC EFFECTS OF HERBICIDE GLIALKA STAR AND LEAD-ACETATE ON CHICKEN EMBRYOS. Original Title: GLIALKA STAR GYOMIRTO SZER ES AZ OLOM-ACETAT EGYEDI ES INTERAKCIOS TOXICITASANAK VIZSGALATA MADAREMBRIOKBAN.	Novenyvdelem (2016), Vol. 52, No. 10, pp. 483-487	Formulation tested via injection to chicken embryos. This is not a typical route of exposure. Tested formulation was not the representative formulation for the renewal.
1511	Toxicology and metabolism	Szepanowski F. et al.	2018	Glyphosate-based herbicide, but not pure glyphosate, affects peripheral nervous system myelination.	European Journal of Neurology (2018), Vol. 25, Supp. 2, pp. 567.	Effects observed in this study were noted with a glyphosate based herbicide only in vitro. In addition, as this was not the representative formulation the article is not relevant to the renewal.
1512	Toxicology and metabolism	Teleken J. L. et al.	2019	Glyphosate-based herbicide exposure during pregnancy and lactation malprograms the male reproductive morphofunction in F1 offspring.	Journal of developmental origins of health and disease (2019), Vol. 11, No. 2, pp 146-153	This study described a glyphosate based herbicidedosed to mice. As this was not the representative formulation the article is not relevant to the renewal.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1513	Toxicology and metabolism	Tincher C. et al.	2017	The Glyphosate-Based Herbicide Roundup Does not Elevate Genome-Wide Mutagenesis of Escherichia coli.	G3 (Bethesda, Md.) (2017), Vol. 7, No. 10, pp. 3331-3335	This publication is considered not relevant for the risk assessment of glyphosate as a glyphosate based formulation was used instead of glyphosate for in vitro testing.
1514	Toxicology and metabolism	Tizhe E. et al.	2018	Pancreatic function and histoarchitecture in Wistar rats following chronic exposure to Bushfire®: the mitigating role of zinc.	The Journal of international medical research (2018), Vol. 46, No. 8, pp. 3296-3305	The formulation tested (BushfireVR, containing 441 g/L potassium salt; 360 g a.e./L) is not the representative formulation the article is not relevant to the renewal.
1515	Toxicology and metabolism	Tizhe E. V. et al.	2014	Serum biochemical assessment of hepatic and renal functions of rats during oral exposure to glyphosate with zinc.	Comparative clinical pathology (2014), Vol. 23, pp. 1043-1050	This publication is considered not relevant for the risk assessment of glyphosate as a combination of zinc chloride and a glyphosate formulation (Bushfire) has been used instead of glyphosate.
1516	Toxicology and metabolism	Tizhe E. V. et al.	2019	Effect of zinc on erythrocyte osmotic fragility and hemogram following chronic exposure to glyphosate-based herbicide in Wistar rats	Comparative Clinical Pathology (2019), Vol. 28, pp. 1275-1279	Formulation tested (BUSHFIRE, Ningbo Agro-star Industrial Co., Ltd., Zhejiang, China; 441 g/L potassium salt, 360 g/L a.e.). As this was not the representative formulation the article is not relevant to the renewal.
1517	Toxicology and metabolism	Tsatsakis A. M. et al.	2019	Hormetic Neurobehavioral effects of low dose toxic chemical mixtures in real-life risk simulation (RLRS) in rats	Food and Chemical Toxicology (2019), 125, 141-149	The test material was a mixture of thirteen different chemicals and cannot be interpreted for glyphosate alone.
1518	Toxicology and metabolism	Turkmen R. et al.	2019	Prenatal and neonatal exposure to glyphosate-based herbicide reduces the primordial to primary follicle transition in the newborn rat ovary: a preliminary study	Kocatepe Veterinary Journal (2019), Vol. 12, No. 2, pp. 168-177	Rats gavaged with a glyphosate based herbicide [Knockdown 48 SL; Safa Agriculture Inc., Turkey] As this was not the representative formulation the article is not relevant to the renewal.
1519	Toxicology and metabolism	Turkmen R. et al.	2019	Protective effects of resveratrol on biomarkers of oxidative stress, biochemical and histopathological changes induced by sub-chronic oral glyphosate-based herbicide in rats.	Toxicology research (2019), Vol. 8, No. 2, pp. 238-245	This paper describes high oral gavage dosing of a glyphosate based herbicide. As this is not the representative formulation the article is not relevant to the renewal.
1520	Toxicology and metabolism	Turkmen R. et al.	2019	Antioxidant and cytoprotective effects of N-acetylcysteine against subchronic oral glyphosate-based herbicide-induced oxidative stress in rats.	Environmental science and pollution research international (2019), Vol. 26, No. 11, pp. 11427-11437	The formulation tested in this article (Knockdown 48SL, Safa Agriculture Corp., Turkey; containing 480 g/L isopropylamine salt) is not the representative formulation and is not relevant to the renewal.
1521	Toxicology and metabolism	Upadhyay J. et al.	2019	Biomarker responses (serum biochemistry) in pregnant female wistar rats and histopathology of their neonates exposed prenatally to pesticides	Brazilian Journal of Pharmaceutical Sciences (2019), Vol. 55, pp. e18194	In this report a glyphosate based herbicide was tested (Topper 77; Crystal Crop Protection Pvt. Ltd. India) at one dose to six rats and compared with controls. As this was not the representative formulation the article is not relevant to the renewal.
1522	Toxicology and metabolism	Vandenberg L. N. et al.	2017	Is it time to reassess current safety standards for glyphosate-based herbicides?.	Journal of epidemiology and community health (2017), Vol. 71, No. 6, pp. 613-618	This publication is considered not relevant because it is not based on experimental work.
1523	Toxicology and metabolism	Varayoud J. et al.	2017	Effects of a glyphosate-based herbicide on the uterus of adult ovariectomized rats.	Environmental toxicology (2017), Vol. 32, No. 4, pp. 1191-1201	This publication is considered not relevant for the risk assessment of glyphosate as a non-representative glyphosate formulation was tested instead of glyphosate.

No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1524	Toxicology and metabolism	Vinceti M. et al.	2017	Pesticide exposure assessed through agricultural crop proximity and risk of amyotrophic lateral sclerosis.	Environmental Health (2017), Vol. 16, No. 1. pp. 91	This article does not demonstrate correlations with glyphosate use and effect and is therefore not relevant.
1525	Toxicology and metabolism	Von Ehrenstein O. S. et al.	2019	Prenatal and infant exposure to ambient pesticides and autism spectrum disorder in children: Population based case-control study	BMJ (Online) (2019), Vol. 364, pp. l962	This publication is not relevant for the risk assessment of glyphosate with relation to ED because the pathology investigated is not ED related (autism spectrum disorder in children).
1526	Toxicology and metabolism	Wallace Hayes A.	2014	Editor in Chief of Food and Chemical Toxicology answers questions on retraction	Food and chemical toxicology (2014), Vol. 65, pp. 394-5	Letter from editor on Seralini retraction (2012) -> #2472, 3617, 5654 (all not relevant)
1527	Toxicology and metabolism	Wang F. et al.	2018	Advance on clinical study of glyphosate toxicity.	Journal of Environmental & Occupational Medicine (2018), Vol. 35, No. 2, pp. 175-179	A review and summary of selected literature.
1528	Toxicology and metabolism	Wilhelm C. M. et al.	2015	Assessment of DNA damage in floriculturists in southern Brazil	Environmental Science and Pollution Research (2015), Vol. 22, No. 11, pp. 8182-8189	No glyphosate specific conclusions, confounded due to multiple pesticide uses.
1529	Toxicology and metabolism	Wilke R. A. et al.	2019	Chronic Kidney Disease in Agricultural Communities	AMERICAN JOURNAL OF MEDICINE (2019), Vol. 132, No. 10, pp. E727-E732	Discussion of different factors that could be used to predict prevalence of chronic kidney disease in the US.
1530	Toxicology and metabolism	Witherspoon N. O.	2019	Protecting children from known pesticides exposures: our collective duty to provide primary prevention.	Pediatric Research (2019), Vol. 85, No. 2, pp. 118-119	Study does not include data on glyphosate and is therefore not relevant.
1531	Toxicology and metabolism	Wongta A. et al.	2018	The Pesticide Exposure of People Living in Agricultural Community, Northern Thailand.	Journal of toxicology (2018), Vol. 2018, pp. 4168034	Farming practices in Thailand are not applicable to European farmer exposure scenarios.
1532	Toxicology and metabolism	Wozniak E. et al.	2018	The mechanism of DNA damage induced by Roundup 360 PLUS, glyphosate and AMPA in human peripheral blood mononuclear cells - genotoxic risk assessement.	Food and chemical toxicology (2018), Vol. 120, pp. 510-522	In vitro effects only noted at excessively high doses greater than 100-250 uM. Therefore this article is not relevant to the risk assessment.
1533	Toxicology and metabolism	Wumbei A. et al.	2019	Pesticides use and exposure among yam farmers in the Nanumba traditional area of Ghana.	Environmental monitoring and assessment (2019), Vol. 191, No. 5, pp. 307	Article is not relevant to agricultural practices and glyphosate uses in Europe.
1534	Toxicology and metabolism	Youness E. R. et al.	2016	The protective effect of orange juice on glyphosate toxicity in adult male mice.	Journal of Chemical and Pharmaceutical Research (2016), Vol. 8, No. 3, pp. 13-28	This study uses excessively high gavage doses to rats and is not relevant to renewal.
1535	Toxicology and metabolism	Yu H. et al.	2013	The antagonistic effects of tea polyphenols on damage of mouse Sertoli cells induced by glyphosate.	Acta Nutrimenta Sinica (2013), Vol. 35, No. 3, pp. 283-287	In vitro study testing of what appears to be a formulated product, described as, glyphosate (41% Isopropylamine Hydrochloride, Monsanto glyphosate (41% Isopropylamine Hydrochloride, Monsanto), dosed at 10-160 ug/mL (high glyphosate levels of 24-390 uM plus surfactant), well above any potential physiological concentrations in sertoli cells.
1536	Toxicology and metabolism	Yu N. et al.	2018	Circular RNA expression profiles in hippocampus from mice with perinatal glyphosate exposure.	Biochemical and biophysical research communications (2018), Vol. 501, No. 4, pp. 838-845	This publication is considered not relevant for risk assessment of glyphosate with relation to ED because a no ED related endpoint was investigated (circular RNA expression profiles in the hippocampus).
1537	Toxicology and metabolism	Zanardi M. V. et al.	2019	Glyphosate-based herbicide induces hyperplastic ducts in the mammary gland of aging Wistar rats.	Molecular and cellular endocrinology (2019), Vol. 501, pp. 110658	This study examines the effects of glyphosate based herbicide dosed to rats. As this is not the representative formulation the article is not relevant to the renewal.

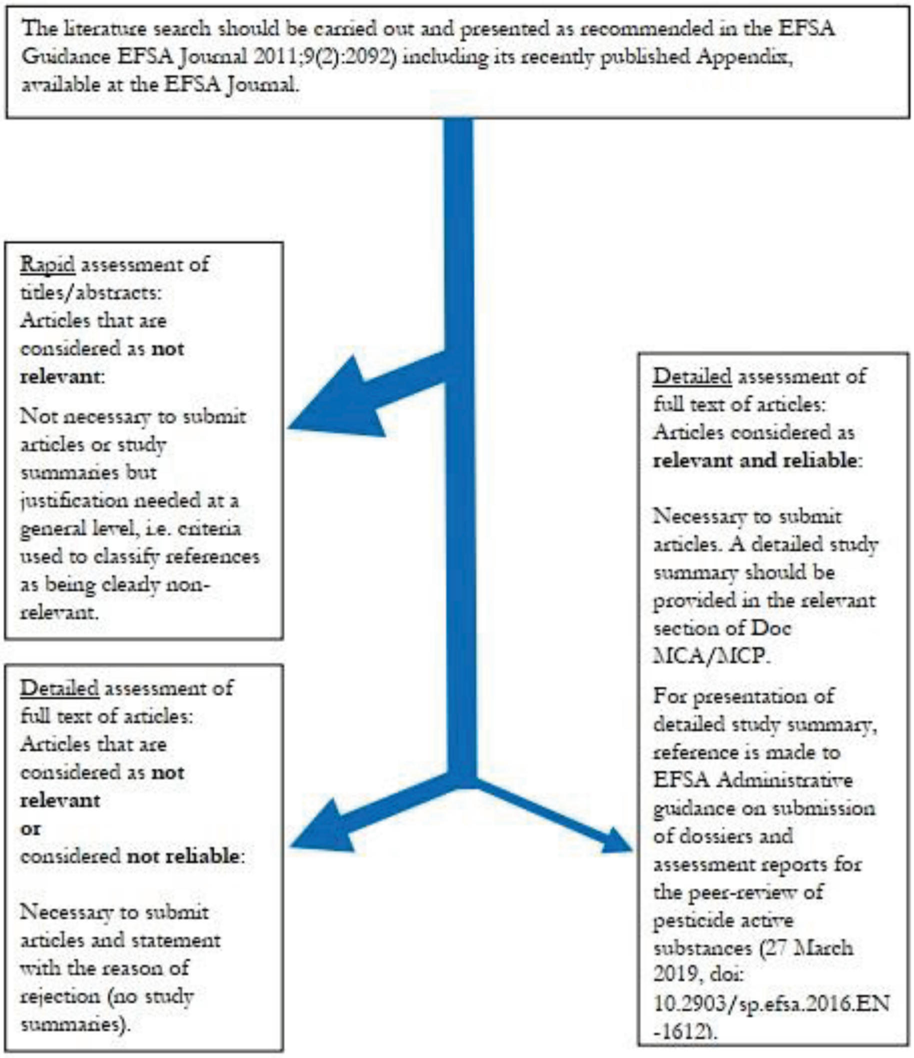
No	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
1538	Toxicology and metabolism	Zhang H.-C. et al.	2018	Molecular cloning, characterization, expression and enzyme activity of catalase from planarian Dugesia japonica in response to environmental pollutants.	Ecotoxicology and environmental safety (2018), Vol. 165, pp. 88-95	Novel microbial test system of questionable relevance to human health risk assessment.
1539	Toxicology and metabolism	Zhao W. et al.	2013	Effects of glyphosate on apoptosis and expressions of androgen-binding protein and vimentin mRNA in mouse Sertoli cells	Journal of Southern Medical University (2013), Vol. 33, No. 11, pp. 1709-13	Not relevant. In vitro testing of a glyphosate based herbicide.
1540	Toxicology and metabolism	Zhao W-H. et al.	2016	THE PROTECTIVE EFFECTS OF TEA POLYSACCHARIDES ON INJURY AND APOPTOSIS OF MOUSE SERTOLY CELLS INDUCED BY GLYPHOSATE.	Current Topics in Nutraceutical Research (2016), Vol. 14, No. 1, pp. 81-90	Not relevant. In vitro testing of a glyphosate based herbicide.
1541	Toxicology and metabolism	Zhu J. et al.	2018	An Effective Machine Learning Approach for Identifying the Glyphosate Poisoning Status in Rats Using Blood Routine Test	IEEE ACCESS (2018), Vol. 6, pp. 15653-15662	Test substance souce not identified, not clear whether glyphosate or formulation administered to animals. Data used in development of machine learning.
1542	Toxicology and metabolism	Zoccali C.	2017	Causal mechanism and component causes in Mesoamerican-Sri Lankan nephropathy: the moderator's view	NEPHROLOGY DIALYSIS TRANSPLANTATION (2017), Vol. 32, No. 4, pp. 607-610	No glyphosate specific information provided.

Appendix 1: AGG ADVICE on how to present the literature search in the dossier

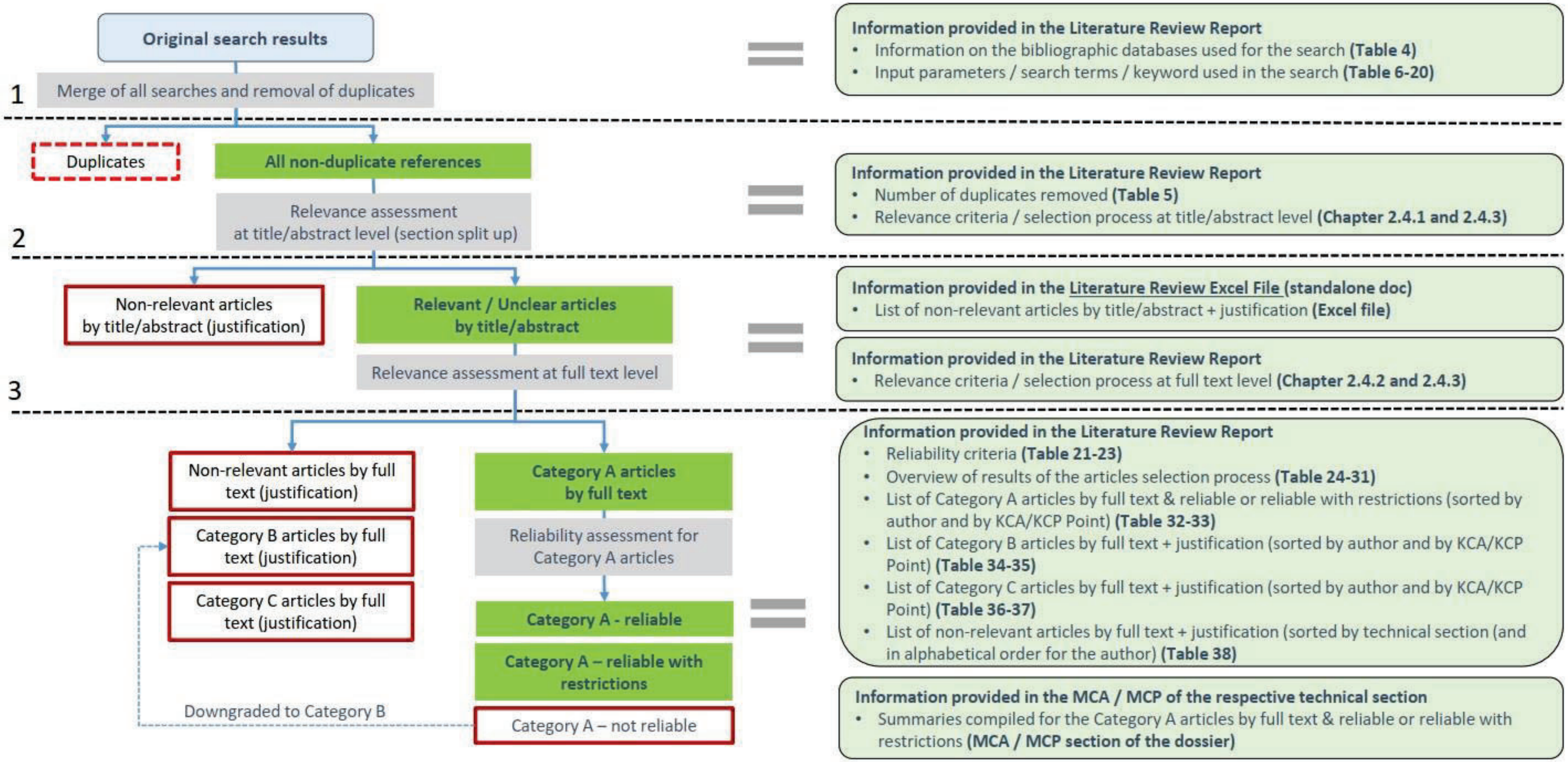
ASSESSMENT GROUP ON GLYPHOSATE (AGG)

October 2019

ADVICE TO GTF2:
HOW TO PRESENT THE LITERATURE SEARCH
IN THE DOSSIER TO BE SUBMITTED JUNE 2020



Appendix 2: The process of articles selection



Appendix 3: ORIGINAL SEARCH QUERY - Part 0

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            5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
            69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
            OR 1066-51-9
            SAVE TEMP L1 GLY1/Q
L2          QUE SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
            ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
            AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
             PHOSPHONIC ACID OR 57637-97-5
            SAVE TEMP L2 GLY2/Q
L3          QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
            HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
            IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
            EYE? OR IRRIT? OR SENSI? OR ALLERG?
L4          QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
            GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
            METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
            ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L5          QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
            CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
            OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
            OR HORMON? OR GONAD? OR DISRUPT?
L6          QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
            MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
            PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
            EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
            OCCUPAT?
L7          QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
            MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
            CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
            RISK ASSESSMENT?
L8          QUE SPE=ON  ABB=ON  PLU=ON  (L3 OR L4 OR L5 OR L6 OR L7)
            SAVE TEMP L8 TOX/Q
L9          QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
            OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
            METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
            MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L10         QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
            PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
            HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
            OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L11         QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
            OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L12         QUE SPE=ON  ABB=ON  PLU=ON  (L9 OR L10 OR L11)
            SAVE TEMP L12 RES/Q
L13         QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
            DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
            SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
            AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L14         QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
             OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
            OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
            ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L15         QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
            PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
            HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
            MOVEMENT OR REMOVAL  OR DRINKING WATER OR WATER TREATMENT
            PROCESSES
L16         QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
            NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
            OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
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            BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
            EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT?  OR BIODIVERS? OR
            PROTECTION GOALS OR ECO?
L19         QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
            OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
            OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
            OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
            OR ALG? OR CHIRON?
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            LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
            INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
            APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L21         QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L22         QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
            FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
            RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
            ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
            PARASITOID
L23         QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
            OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
            OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
            MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
            NITROGEN
L24         QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
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          SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
          ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
          OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
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Final search - publication year 2010-2011:

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          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L4           5 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
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          T
L9           3 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
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          T
L14          7 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L15          1 SEA SPE=ON  ABB=ON  PLU=ON  L14 AND 2010-2011/PY
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          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
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L20          5 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
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          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
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CHARGED TO COST=108689
L27       4932 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L28        505 SEA SPE=ON  ABB=ON  PLU=ON  L27 AND 2010-2011/PY
L29        468 SEA SPE=ON  ABB=ON  PLU=ON  L28 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L30          1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L31          1 SEA SPE=ON  ABB=ON  PLU=ON  L30 AND 2010-2011/PY
L32          0 SEA SPE=ON  ABB=ON  PLU=ON  L31 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T

   FILE 'TOXCENTER' ENTERED AT 13:15:40 ON 28 OCT 2019
CHARGED TO COST=108689
L33      14261 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L34       1677 SEA SPE=ON  ABB=ON  PLU=ON  L33 AND 2010-2011/PY
L35        736 SEA SPE=ON  ABB=ON  PLU=ON  L34 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L36         21 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L37          2 SEA SPE=ON  ABB=ON  PLU=ON  L36 AND 2010-2011/PY
L38          2 SEA SPE=ON  ABB=ON  PLU=ON  L37 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T

   FILE 'EMBASE' ENTERED AT 13:17:00 ON 28 OCT 2019
CHARGED TO COST=108689
L39       4013 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L40        336 SEA SPE=ON  ABB=ON  PLU=ON  L39 AND 2010-2011/PY
L41        335 SEA SPE=ON  ABB=ON  PLU=ON  L40 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L42          5 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L43          0 SEA SPE=ON  ABB=ON  PLU=ON  L42 AND 2010-2011/PY
```

```
    FILE 'ESBIOBASE' ENTERED AT 13:18:05 ON 28 OCT 2019
CHARGED TO COST=108689
L44       4567 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L45        390 SEA SPE=ON  ABB=ON  PLU=ON  L44 AND 2010-2011/PY
L46        390 SEA SPE=ON  ABB=ON  PLU=ON  L45 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L47          1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L48          0 SEA SPE=ON  ABB=ON  PLU=ON  L47 AND 2010-2011/PY

    FILE 'HCAPLUS' ENTERED AT 13:19:10 ON 28 OCT 2019
CHARGED TO COST=108689
L49      23450 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L50       3195 SEA SPE=ON  ABB=ON  PLU=ON  L49 AND 2010-2011/PY
L51        896 SEA SPE=ON  ABB=ON  PLU=ON  L50 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L52         59 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L53          6 SEA SPE=ON  ABB=ON  PLU=ON  L52 AND 2010-2011/PY
L54          3 SEA SPE=ON  ABB=ON  PLU=ON  L53 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T

    FILE 'SCISEARCH' ENTERED AT 13:20:41 ON 28 OCT 2019
CHARGED TO COST=108689
L55      10341 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L56        820 SEA SPE=ON  ABB=ON  PLU=ON  L55 AND 2010-2011/PY
L57        815 SEA SPE=ON  ABB=ON  PLU=ON  L56 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L58          4 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L59          0 SEA SPE=ON  ABB=ON  PLU=ON  L58 AND 2010-2011/PY

    FILE 'TOXCENTER, HCAPLUS' ENTERED AT 13:28:27 ON 28 OCT 2019
CHARGED TO COST=108689
L60          3 DUP REM L38 L54 (2 DUPLICATES REMOVED)
               ANSWERS '1-2' FROM FILE TOXCENTER
               ANSWER '3' FROM FILE HCAPLUS
           SAVE L60 GLY2SUBST/A

    FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
    EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 13:29:29 ON 28 OCT 2019
CHARGED TO COST=108689
L61       1955 DUP REM L3 L8 L13 L19 L24 L29 L35 L41 L46 L51 L57 (3980 DUPLICA
               ANSWERS '1-249' FROM FILE MEDLINE
               ANSWERS '250-535' FROM FILE AGRICOLA
               ANSWERS '536-705' FROM FILE BIOSIS
               ANSWERS '706-1209' FROM FILE CABA
               ANSWERS '1210-1218' FROM FILE FSTA
               ANSWERS '1219-1365' FROM FILE PQSCITECH
               ANSWERS '1366-1544' FROM FILE TOXCENTER
               ANSWERS '1545-1602' FROM FILE EMBASE
               ANSWERS '1603-1619' FROM FILE ESBIOBASE
               ANSWERS '1620-1799' FROM FILE HCAPLUS
               ANSWERS '1800-1955' FROM FILE SCISEARCH
           SAVE L61 GLY1SUBST/A
L62       1956 SEA SPE=ON  ABB=ON  PLU=ON  L60 OR L61
L63       1349 SEA SPE=ON  ABB=ON  PLU=ON  L62 AND TOX/Q
           SAVE L63 GLYTOX/A
L64       1630 SEA SPE=ON  ABB=ON  PLU=ON  L62 AND RES/Q
           SAVE L64 GLYRES/A
L65       1015 SEA SPE=ON  ABB=ON  PLU=ON  L61 AND FATE/Q
           SAVE L65 GLYFATE/A
L66       1764 SEA SPE=ON  ABB=ON  PLU=ON  L61 AND ECO/Q
           SAVE L66 GLYECO/A
L67       1911 SEA SPE=ON  ABB=ON  PLU=ON  L63 OR L64 OR L65 OR L66
           SAVE L67 GLY201011/A
E301354C       PRINT WZULEGER@KNOELL.COM N ALL


 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 14:02:42 ON 28 OCT 2019
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Appendix 4: ORIGINAL SEARCH QUERY - Part 1

```
   FILE 'MEDLINE' ENTERED AT 12:21:51 ON 08 JUN 2018
CHARGED TO COST=108689
L1      2816 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L2      1216 SEA SPE=ON  ABB=ON  PLU=ON  L1 AND 2012-2017/PY
L3      1186 SEA SPE=ON  ABB=ON  PLU=ON  L2 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L3 GLY1MEDL/A
L4         3 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L5         2 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND 2012-2017/PY
L6         2 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L6 GLY2MEDL/A

   FILE 'AGRICOLA' ENTERED AT 12:31:43 ON 08 JUN 2018
CHARGED TO COST=108689
L7      6075 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L8      1482 SEA SPE=ON  ABB=ON  PLU=ON  L7 AND 2012-2017/PY
L9      1482 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L8 GLY1AGRI/A
L10        1 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L11        1 SEA SPE=ON  ABB=ON  PLU=ON  L10 AND 2012-2017/PY
L12        1 SEA SPE=ON  ABB=ON  PLU=ON  L11 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L12 GLY2AGRI/A

   FILE 'BIOSIS' ENTERED AT 12:37:15 ON 08 JUN 2018
CHARGED TO COST=108689
L13     9348 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L14     2599 SEA SPE=ON  ABB=ON  PLU=ON  L13 AND 2012-2017/PY
L15     2214 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L15 GLY1BIOS/A
L16        4 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L17        2 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND 2012-2017/PY
L18        2 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L18 GLY2BIOS/A

   FILE 'CABA' ENTERED AT 12:40:03 ON 08 JUN 2018
CHARGED TO COST=108689
L19    16954 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L20     3417 SEA SPE=ON  ABB=ON  PLU=ON  L19 AND 2012-2017/PY
L21     3416 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L21 GLY1CABA/A
L22        2 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L23        2 SEA SPE=ON  ABB=ON  PLU=ON  L22 AND 2012-2017/PY
L24        2 SEA SPE=ON  ABB=ON  PLU=ON  L23 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L24 GLY2CABA/A

   FILE 'FSTA' ENTERED AT 12:45:13 ON 08 JUN 2018
CHARGED TO COST=108689
L25      427 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
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         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L26      181 SEA SPE=ON  ABB=ON  PLU=ON  L25 AND 2012-2017/PY
L27      174 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L27 GLY1FSTA/A
L28        3 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L29        2 SEA SPE=ON  ABB=ON  PLU=ON  L28 AND 2012-2017/PY
L30        2 SEA SPE=ON  ABB=ON  PLU=ON  L29 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L30 GLY2FSTA/A

     FILE 'PQSCITECH' ENTERED AT 12:48:48 ON 08 JUN 2018
CHARGED TO COST=108689
L31     4671 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L32     1171 SEA SPE=ON  ABB=ON  PLU=ON  L31 AND 2012-2017/PY
L33     1043 SEA SPE=ON  ABB=ON  PLU=ON  L32 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L33 GLY1PQSCI/A
L34        1 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L35        0 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND 2012-2017/PY

     FILE 'TOXCENTER' ENTERED AT 12:51:18 ON 08 JUN 2018
CHARGED TO COST=108689
L36    12807 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L37     4701 SEA SPE=ON  ABB=ON  PLU=ON  L36 AND 2012-2017/PY
L38     2929 SEA SPE=ON  ABB=ON  PLU=ON  L37 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L38 GLY1TOXC/A
L39       16 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L40        6 SEA SPE=ON  ABB=ON  PLU=ON  L39 AND 2012-2017/PY
L41        6 SEA SPE=ON  ABB=ON  PLU=ON  L40 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L41 GLY2TOXC/A

     FILE 'EMBASE' ENTERED AT 12:55:29 ON 08 JUN 2018
CHARGED TO COST=108689
L42     3332 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L43     1399 SEA SPE=ON  ABB=ON  PLU=ON  L42 AND 2012-2017/PY
L44     1388 SEA SPE=ON  ABB=ON  PLU=ON  L43 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L44 GLY1EMBAS/A
L45        2 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L46        2 SEA SPE=ON  ABB=ON  PLU=ON  L45 AND 2012-2017/PY
L47        2 SEA SPE=ON  ABB=ON  PLU=ON  L46 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L47 GLY2EMBAS/A

     FILE 'ESBIOBASE' ENTERED AT 12:59:06 ON 08 JUN 2018
CHARGED TO COST=108689
L48     4062 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L49     1424 SEA SPE=ON  ABB=ON  PLU=ON  L48 AND 2012-2017/PY
L50     1420 SEA SPE=ON  ABB=ON  PLU=ON  L49 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L50 GLY1ESBIO/A
L51        1 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
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```
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L52       1 SEA SPE=ON  ABB=ON  PLU=ON  L51 AND 2012-2017/PY
L53       1 SEA SPE=ON  ABB=ON  PLU=ON  L52 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L53 GLY2ESBIO/A

   FILE 'HCAPLUS' ENTERED AT 13:06:10 ON 08 JUN 2018
CHARGED TO COST=108689
L54   21464 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L55    9051 SEA SPE=ON  ABB=ON  PLU=ON  L54 AND 2012-2017/PY
L56    3028 SEA SPE=ON  ABB=ON  PLU=ON  L55 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L56 GLY1HCAP/A
L57      49 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L58      15 SEA SPE=ON  ABB=ON  PLU=ON  L57 AND 2012-2017/PY
L59       8 SEA SPE=ON  ABB=ON  PLU=ON  L58 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L59 GLY2HCAP/A

   FILE 'SCISEARCH' ENTERED AT 13:08:59 ON 08 JUN 2018
CHARGED TO COST=108689
L60    9189 SEA SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
         GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
         5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
         69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
         OR 1066-51-9
L61    3278 SEA SPE=ON  ABB=ON  PLU=ON  L60 AND 2012-2017/PY
L62    3234 SEA SPE=ON  ABB=ON  PLU=ON  L61 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L62 GLY1SCIS/A
L63       3 SEA SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
         ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
         ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
         AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
          PHOSPHONIC ACID OR 57637-97-5
L64       2 SEA SPE=ON  ABB=ON  PLU=ON  L63 AND 2012-2017/PY
L65       2 SEA SPE=ON  ABB=ON  PLU=ON  L64 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L65 GLY2SCIS/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, TOXCENTER, EMBASE,
   ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 13:15:58 ON 08 JUN 2018
CHARGED TO COST=108689
L66      11 DUP REM L6 L12 L18 L24 L30 L41 L47 L53 L59 L65 (17 DUPLICATES R
            ANSWERS '1-2' FROM FILE MEDLINE
            ANSWER '3' FROM FILE CABA
            ANSWER '4' FROM FILE FSTA
            ANSWERS '5-6' FROM FILE TOXCENTER
            ANSWERS '7-11' FROM FILE HCAPLUS
         SAVE L66 GLY1/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 13:18:05 ON 08 JUN 2018
CHARGED TO COST=108689
L67    7119 DUP REM L3 L8 L15 L21 L27 L33 L38 L44 L50 L56 L62 (14395 DUPLIC
            ANSWERS '1-1186' FROM FILE MEDLINE
            ANSWERS '1187-2095' FROM FILE AGRICOLA
            ANSWERS '2096-2843' FROM FILE BIOSIS
            ANSWERS '2844-4456' FROM FILE CABA
            ANSWERS '4457-4510' FROM FILE FSTA
            ANSWERS '4511-4845' FROM FILE PQSCITECH
            ANSWERS '4846-5504' FROM FILE TOXCENTER
            ANSWERS '5505-5753' FROM FILE EMBASE
            ANSWERS '5754-5800' FROM FILE ESBIOBASE
            ANSWERS '5801-6426' FROM FILE HCAPLUS
            ANSWERS '6427-7119' FROM FILE SCISEARCH
L68    7123 SEA SPE=ON  ABB=ON  PLU=ON  L66 OR L67
L69    2786 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (TOX? OR HAZARD? OR
         ADVERSE OR HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR
         IN VIVO OR IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR
         SKIN? OR EYE? OR IRRIT? OR SENSI? OR ALLERG?)
L70    2062 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (RAT OR RATS OR DOG? OR
         RABBIT? OR GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR
         METABOLITE? OR METABOLIC OR DISTRIBUTION OR ADSORPTION OR
         EXCRETION OR ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?)
L71    2897 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (GEN? OR MUTA? OR CHROMOS?
         OR CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR
         TUMOUR? OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR
         ENDOCRIN? OR HORMON? OR GONAD? OR DISRUPT?)
L72    2459 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (REPRODUCT? OR DEVELOPMENT?
          OR MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN?
         OR PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
         EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
         OCCUPAT?)
L73     793 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (BIOMONITORING OR HUMAN
         EXPOSURE OR MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR
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        NECROSIS OR CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR
        SURFACTANT OR RISK ASSESSMENT?)
L74     5428 SEA SPE=ON  ABB=ON  PLU=ON  (L69 OR L70 OR L71 OR L72 OR L73)

        SAVE L74 GLYTOX/A
L75     2180 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (UPTAKE OR TRANSLOCATION
        OR RUMEN OR STORAGE STABILITY OR STORAGE OR STABILITY OR
        METABOLIC OR METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR
        RESIDUE? OR MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF
        PROCESSING)
L76     5121 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (DESSICANT OR PREHARVEST
        OR PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
        HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
        OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?)
L77     1847 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND (GOAT? OR COW? OR PIG? OR
        DIETARY OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR
        EXPOSURE)
L78     6170 SEA SPE=ON  ABB=ON  PLU=ON  (L75 OR L76 OR L77)
        SAVE L78 GLYRES/A
L79     2696 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (SOIL OR WATER OR SEDIMENT
        OR DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
        SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
        AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER)
L80     1145 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (CONTAMINAT? OR MICROB? OR
        EXUDATION OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR
        HYDROLYSIS OR DRIFT OR RUN-OFF OR RUNOFF OR DRAINAGE OR VOLAT?
        OR ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT)

L81     1327 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (TRANSPORT OR MICRONUTRIENT
         OR PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
        HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
        MOVEMENT OR REMOVAL OR DRINKING WATER OR WATER TREATMENT
        PROCESSES)
L82     1105 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (ATMOSPHERIC DEPOSITION OR
        TILE-DRAINS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT
         OR OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR
        RAINWATER OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATIO
        N OR PERSISTENCE OR LIGAND)
L83     3895 SEA SPE=ON  ABB=ON  PLU=ON  (L79 OR L80 OR L81 OR L82)
        SAVE L83 GLYFATE/A
L84     4237 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (TOX? OR ECOTOX? OR ?TOXIC
        OR ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
        BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
        EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT? OR BIODIVERS? OR
        PROTECTION GOALS OR ECO?)
L85     3189 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (IMPACT OR POPULATION OR
        COMMUNITY OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR
        CHRONIC OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE
        OR ANAS? OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR
        DAPHNI? OR ALG? OR CHIRON?)
L86     1935 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (SEDIMENT DWELL? OR
        BENTHIC OR LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD
        ? OR INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS
        OR APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR)
L87     2102 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (SOLITARY OR ALG? OR
        AQUATIC OR FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE
        OR MICE OR RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR
        PEST OR ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS
        OR PARASITOID)
L88     1953 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (PREDATOR OR CHRYSOPERLA
        OR ORIUS OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR
        COLLEMBOL? OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR
        DECOMPOS? OR MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR
        CARBON OR NITROGEN)
L89     3955 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND (PLANT? OR VEGETATIVE
        VIGO? OR SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR
        SEWAGE OR ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION?
        OR AMPHIB? OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL)
L90      446 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND PLANT AND (SUBMERGE? OR
        EMERGE?)
L91     6605 SEA SPE=ON  ABB=ON  PLU=ON  (L84 OR L85 OR L86 OR L87 OR L88
        OR L89 OR L90)
        SAVE L91 GLYECO/A
L92     7031 SEA SPE=ON  ABB=ON  PLU=ON  L74 OR L78 OR L83 OR L91
        SAVE L92 GLYFINAL/A

STN INTERNATIONAL SESSION SUSPENDED AT 14:17:00 ON 08 JUN 2018
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Appendix 5: ORIGINAL SEARCH QUERY - Part 2a & 2b

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   FILE 'MEDLINE' ENTERED AT 13:56:20 ON 04 JUL 2019
CHARGED TO COST=108689
L1        QUE SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
          GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
          5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
          69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
          OR 1066-51-9
          SAVE L1 GLY1/Q

L2        QUE SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
          ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
          ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
          AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
           PHOSPHONIC ACID OR 57637-97-5
          SAVE L2 GLY2/Q

L3        QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
          HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
          IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
          EYE? OR IRRIT? OR SENSI? OR ALLERG?
L4        QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
          GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
          METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
          ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L5        QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
          CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
          OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
          OR HORMON? OR GONAD? OR DISRUPT?
L6        QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
          MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
          PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
          EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
          OCCUPAT?
L7        QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
          MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
          CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
          RISK ASSESSMENT?
L8        QUE SPE=ON  ABB=ON  PLU=ON  (L3 OR L4 OR L5 OR L6 OR L7)
          SAVE L8 TOX/Q

L9        QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
          OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
          METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
          MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L10       QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
          PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
          HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
          OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L11       QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
          OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L12       QUE SPE=ON  ABB=ON  PLU=ON  (L9 OR L10 OR L11)
          SAVE L12 RES/Q

L13       QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
          DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
          SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
          AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L14       QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
           OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
          OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
          ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L15       QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
          PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
          HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
          MOVEMENT OR REMOVAL  OR DRINKING WATER OR WATER TREATMENT
          PROCESSES
L16       QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
          NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
          OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
          OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
          PERSISTENCE OR LIGAND
L17       QUE SPE=ON  ABB=ON  PLU=ON  (L13 OR L14 OR L15 OR L16)
          SAVE L17 FATE/Q

L18       QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
          ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
          BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
          EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT?  OR BIODIVERS? OR
          PROTECTION GOALS OR ECO?
L19       QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
          OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
          OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
          OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
          OR ALG? OR CHIRON?
L20       QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
          LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
          INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
          APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L21       QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L22       QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
          FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
          RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
          ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
          PARASITOID
L23       QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
          OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
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         OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
         MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
         NITROGEN
L24        QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
         SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
         ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
         OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
L25        QUE SPE=ON  ABB=ON  PLU=ON  (L18 OR L19 OR L20 OR L21 OR L22
         OR L23 OR L24)
         SAVE L25 ECO/Q

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 14:25:17 ON 04 JUL 2019
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Final search - publication year 2010-2011 and 2018:

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   FILE 'MEDLINE' ENTERED AT 13:20:48 ON 08 JUL 2019
CHARGED TO COST=108689
L1      3202 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L2       602 SEA SPE=ON  ABB=ON  PLU=ON  L1 AND (2010-2011/PY OR 2018/PY)
L3       582 SEA SPE=ON  ABB=ON  PLU=ON  L2 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L3 GLY1MEDL/A
L4         4 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L5         1 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND (2010-2011/PY OR 2018/PY)
L6         1 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L6 GLY2MEDL/A

   FILE 'AGRICOLA' ENTERED AT 13:28:28 ON 08 JUL 2019
CHARGED TO COST=108689
L7      6647 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L8       773 SEA SPE=ON  ABB=ON  PLU=ON  L7 AND (2010-2011/PY OR 2018/PY)
L9       773 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L9 GLY1AGRI/A
L10        1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L11        0 SEA SPE=ON  ABB=ON  PLU=ON  L10 AND (2010-2011/PY OR 2018/PY)

   FILE 'BIOSIS' ENTERED AT 13:32:55 ON 08 JUL 2019
CHARGED TO COST=108689
L12    10087 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L13     1325 SEA SPE=ON  ABB=ON  PLU=ON  L12 AND (2010-2011/PY OR 2018/PY)
L14     1134 SEA SPE=ON  ABB=ON  PLU=ON  L13 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L14 GLY1BIOS/A
L15        5 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L16        3 SEA SPE=ON  ABB=ON  PLU=ON  L15 AND (2010-2011/PY OR 2018/PY)
L17        1 SEA SPE=ON  ABB=ON  PLU=ON  L16 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L17 GLY2BIOS/A

   FILE 'CABA' ENTERED AT 13:35:53 ON 08 JUL 2019
CHARGED TO COST=108689
L18    17709 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L19     1582 SEA SPE=ON  ABB=ON  PLU=ON  L18 AND (2010-2011/PY OR 2018/PY)
L20     1581 SEA SPE=ON  ABB=ON  PLU=ON  L19 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L20 GLY1CABA/A
L21        3 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L22        0 SEA SPE=ON  ABB=ON  PLU=ON  L21 AND (2010-2011/PY OR 2018/PY)

   FILE 'FSTA' ENTERED AT 13:37:51 ON 08 JUL 2019
CHARGED TO COST=108689
L23      459 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L24       72 SEA SPE=ON  ABB=ON  PLU=ON  L23 AND (2010-2011/PY OR 2018/PY)
L25       70 SEA SPE=ON  ABB=ON  PLU=ON  L24 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L25 GLY1FSTA/A
L26        3 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L27        1 SEA SPE=ON  ABB=ON  PLU=ON  L26 AND (2010-2011/PY OR 2018/PY)
L28        1 SEA SPE=ON  ABB=ON  PLU=ON  L27 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L28 GLY2FSTA/A

   FILE 'PQSCITECH' ENTERED AT 13:41:25 ON 08 JUL 2019
CHARGED TO COST=108689
L29     4920 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L30      647 SEA SPE=ON  ABB=ON  PLU=ON  L29 AND (2010-2011/PY OR 2018/PY)
L31      592 SEA SPE=ON  ABB=ON  PLU=ON  L30 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE L31 GLY1PQSCI/A
L32        1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L33        1 SEA SPE=ON  ABB=ON  PLU=ON  L32 AND (2010-2011/PY OR 2018/PY)
L34        0 SEA SPE=ON  ABB=ON  PLU=ON  L33 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T

   FILE 'TOXCENTER' ENTERED AT 13:43:02 ON 08 JUL 2019
CHARGED TO COST=108689
L35    13930 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
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L36      2526 SEA SPE=ON  ABB=ON  PLU=ON  L35 AND (2010-2011/PY OR 2018/PY)
L37      1382 SEA SPE=ON  ABB=ON  PLU=ON  L36 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L37 GLY1TOXC/A
L38        20 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L39         6 SEA SPE=ON  ABB=ON  PLU=ON  L38 AND (2010-2011/PY OR 2018/PY)
L40         4 SEA SPE=ON  ABB=ON  PLU=ON  L39 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L40 GLY2TOXC/A

   FILE 'EMBASE' ENTERED AT 13:45:19 ON 08 JUL 2019
CHARGED TO COST=108689
L41      3877 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L42       719 SEA SPE=ON  ABB=ON  PLU=ON  L41 AND (2010-2011/PY OR 2018/PY)
L43       714 SEA SPE=ON  ABB=ON  PLU=ON  L42 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L43 GLY1EMBAS/A
L44         4 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L45         1 SEA SPE=ON  ABB=ON  PLU=ON  L44 AND (2010-2011/PY OR 2018/PY)
L46         1 SEA SPE=ON  ABB=ON  PLU=ON  L45 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L46 GLY2EMBAS/A

   FILE 'ESBIOBASE' ENTERED AT 13:48:00 ON 08 JUL 2019
CHARGED TO COST=108689
L47      4278 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L48       773 SEA SPE=ON  ABB=ON  PLU=ON  L47 AND (2010-2011/PY OR 2018/PY)
L49       771 SEA SPE=ON  ABB=ON  PLU=ON  L48 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L49 GLY1ESBIO/A
L50         1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L51         0 SEA SPE=ON  ABB=ON  PLU=ON  L50 AND (2010-2011/PY OR 2018/PY)

   FILE 'HCAPLUS' ENTERED AT 13:49:40 ON 08 JUL 2019
CHARGED TO COST=108689
L52     23049 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L53      5095 SEA SPE=ON  ABB=ON  PLU=ON  L52 AND (2010-2011/PY OR 2018/PY)
L54      1407 SEA SPE=ON  ABB=ON  PLU=ON  L53 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L54 GLY1HCAP/A
L55        57 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L56        13 SEA SPE=ON  ABB=ON  PLU=ON  L55 AND (2010-2011/PY OR 2018/PY)
L57         6 SEA SPE=ON  ABB=ON  PLU=ON  L56 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L57 GLY2HCAP/A

   FILE 'SCISEARCH' ENTERED AT 13:52:17 ON 08 JUL 2019
CHARGED TO COST=108689
L58     10093 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L59      1608 SEA SPE=ON  ABB=ON  PLU=ON  L58 AND (2010-2011/PY OR 2018/PY)
L60      1586 SEA SPE=ON  ABB=ON  PLU=ON  L59 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L60 GLY1SCIS/A
L61         3 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L62         1 SEA SPE=ON  ABB=ON  PLU=ON  L61 AND (2010-2011/PY OR 2018/PY)
L63         1 SEA SPE=ON  ABB=ON  PLU=ON  L62 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE L63 GLY2SCIS/A

   FILE 'STNGUIDE' ENTERED AT 13:57:54 ON 08 JUL 2019
CHARGED TO COST=108689

   FILE 'MEDLINE, BIOSIS, FSTA, TOXCENTER, EMBASE, HCAPLUS, SCISEARCH'
   ENTERED AT 14:06:02 ON 08 JUL 2019
CHARGED TO COST=108689
L64         7 DUP REM L6 L17 L28 L40 L46 L57 L63 (8 DUPLICATES REMOVED)
               ANSWER '1' FROM FILE MEDLINE
               ANSWERS '2-4' FROM FILE TOXCENTER
               ANSWERS '5-7' FROM FILE HCAPLUS
          SAVE L64 GLY2SUBST/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 14:07:06 ON 08 JUL 2019
CHARGED TO COST=108689
L65      3345 DUP REM L3 L9 L14 L20 L25 L31 L37 L43 L49 L54 L60 (7247 DUPLICA
               ANSWERS '1-581' FROM FILE MEDLINE
               ANSWERS '582-1050' FROM FILE AGRICOLA
               ANSWERS '1051-1384' FROM FILE BIOSIS
               ANSWERS '1385-2096' FROM FILE CABA
               ANSWERS '2097-2115' FROM FILE FSTA
               ANSWERS '2116-2314' FROM FILE PQSCITECH
               ANSWERS '2315-2582' FROM FILE TOXCENTER
               ANSWERS '2583-2709' FROM FILE EMBASE
               ANSWERS '2710-2747' FROM FILE ESBIOBASE
               ANSWERS '2748-3010' FROM FILE HCAPLUS
               ANSWERS '3011-3345' FROM FILE SCISEARCH
          SAVE L65 GLY1SUBST/A
          D COST FUL
L66      3346 SEA SPE=ON  ABB=ON  PLU=ON  L64 OR L65
L67      2492 SEA SPE=ON  ABB=ON  PLU=ON  L66 AND TOX/Q
          SAVE L67 GLYTOX/A
L68      2868 SEA SPE=ON  ABB=ON  PLU=ON  L66 AND RES/Q
```

```
          SAVE L68 GLYRES/A
L69      1831 SEA SPE=ON  ABB=ON  PLU=ON  L65 AND FATE/Q
          SAVE L69 GLYFATE/A
L70      3076 SEA SPE=ON  ABB=ON  PLU=ON  L65 AND ECO/Q
          SAVE L70 GLYECO/A
L71      3291 SEA SPE=ON  ABB=ON  PLU=ON  L67 OR L68 OR L69 OR L70
          SAVE L71 GLYFINALUPD/A

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 16:10:37 ON 08 JUL 2019
```

Final search - amendment of publication year 2019:

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    FILE 'MEDLINE' ENTERED AT 10:54:19 ON 10 JUL 2019
CHARGED TO COST=108689
L1        239 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L2        238 SEA SPE=ON  ABB=ON  PLU=ON  L1 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L3          1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY
L4          1 SEA SPE=ON  ABB=ON  PLU=ON  L3 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T

    FILE 'AGRICOLA' ENTERED AT 10:57:30 ON 10 JUL 2019
CHARGED TO COST=108689
L5        133 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L6        133 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L7          0 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY

    FILE 'BIOSIS' ENTERED AT 10:58:37 ON 10 JUL 2019
CHARGED TO COST=108689
L8        252 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L9        240 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L10         0 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY

    FILE 'CABA' ENTERED AT 10:59:24 ON 10 JUL 2019
CHARGED TO COST=108689
L11       106 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L12       106 SEA SPE=ON  ABB=ON  PLU=ON  L11 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L13         0 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY

    FILE 'FSTA' ENTERED AT 10:59:58 ON 10 JUL 2019
CHARGED TO COST=108689
L14        14 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L15        14 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L16         0 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY

    FILE 'PQSCITECH' ENTERED AT 11:00:51 ON 10 JUL 2019
CHARGED TO COST=108689
L17        51 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L18        45 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L19         0 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY

    FILE 'TOXCENTER' ENTERED AT 11:01:45 ON 10 JUL 2019
CHARGED TO COST=108689
L20       475 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L21       344 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L22         1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY
L23         1 SEA SPE=ON  ABB=ON  PLU=ON  L22 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T

    FILE 'EMBASE' ENTERED AT 11:06:25 ON 10 JUL 2019
CHARGED TO COST=108689
L24       249 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L25       247 SEA SPE=ON  ABB=ON  PLU=ON  L24 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L26         1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY
L27         1 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T

    FILE 'ESBIOBASE' ENTERED AT 11:07:10 ON 10 JUL 2019
CHARGED TO COST=108689
L28       186 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L29       185 SEA SPE=ON  ABB=ON  PLU=ON  L28 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L30         0 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY

    FILE 'HCAPLUS' ENTERED AT 11:08:31 ON 10 JUL 2019
CHARGED TO COST=108689
L31      1153 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L32       293 SEA SPE=ON  ABB=ON  PLU=ON  L31 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L33         3 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY
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```
L34        2 SEA SPE=ON  ABB=ON  PLU=ON  L33 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T

    FILE 'SCISEARCH' ENTERED AT 11:09:30 ON 10 JUL 2019
CHARGED TO COST=108689
L35      393 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q AND 2019/PY
L36      383 SEA SPE=ON  ABB=ON  PLU=ON  L35 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L37        0 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q AND 2019/PY

    FILE 'STNGUIDE' ENTERED AT 11:11:34 ON 10 JUL 2019
CHARGED TO COST=108689

    FILE 'MEDLINE, TOXCENTER, EMBASE, HCAPLUS' ENTERED AT 11:14:41 ON 10 JUL
    2019
CHARGED TO COST=108689
L38        3 DUP REM L4 L23 L27 L34 (2 DUPLICATES REMOVED)
               ANSWER '1' FROM FILE MEDLINE
               ANSWER '2' FROM FILE TOXCENTER
               ANSWER '3' FROM FILE HCAPLUS
           SAVE L38 GLY2SUB2019/A

    FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
    EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 11:15:55 ON 10 JUL 2019
CHARGED TO COST=108689
L39      706 DUP REM L2 L6 L9 L12 L15 L18 L21 L25 L29 L32 L36 (1522 DUPLICAT
               ANSWERS '1-238' FROM FILE MEDLINE
               ANSWERS '239-293' FROM FILE AGRICOLA
               ANSWERS '294-397' FROM FILE BIOSIS
               ANSWERS '398-416' FROM FILE CABA
               ANSWERS '417-418' FROM FILE FSTA
               ANSWERS '419-434' FROM FILE PQSCITECH
               ANSWERS '435-498' FROM FILE TOXCENTER
               ANSWERS '499-539' FROM FILE EMBASE
               ANSWERS '540-555' FROM FILE ESBIOBASE
               ANSWERS '556-601' FROM FILE HCAPLUS
               ANSWERS '602-706' FROM FILE SCISEARCH
           SAVE L39 GLY1SUB2019/A
L40      707 SEA SPE=ON  ABB=ON  PLU=ON  L38 OR L39
L41      623 SEA SPE=ON  ABB=ON  PLU=ON  L40 AND TOX/Q
           SAVE L41 GLYTOX2019/A
L42      613 SEA SPE=ON  ABB=ON  PLU=ON  L40 AND RES/Q
           SAVE L42 GLYRES2019/A
L43      445 SEA SPE=ON  ABB=ON  PLU=ON  L39 AND FATE/Q
           SAVE L43 GLYFATE2019/A
L44      677 SEA SPE=ON  ABB=ON  PLU=ON  L39 AND ECO/Q
           SAVE L44 GLYECO2019/A
L45      703 SEA SPE=ON  ABB=ON  PLU=ON  L41 OR L42 OR L43 OR L44
           SAVE L45 GLYFINAL2019/A

           ACT GLYFINALUPD/A
           ---------
L46(       7)DUP REM L46 L46 L46 L46 L46 L46 L46 (8 DUPLICATES REMOVE
L47(    3345)DUP REM L46 L46 L46 L46 L46 L46 L46 L46 L46 L46 L46
L48(       1)SEA FILE=MEDLINE L46
L49(     581)SEA FILE=MEDLINE L47
L50(     581)SEA FILE=MEDLINE L48 OR L49
L51(       0)SEA FILE=AGRICOLA L46
L52(     469)SEA FILE=AGRICOLA L47
L53(     469)SEA FILE=AGRICOLA L51 OR L52
L54(       0)SEA FILE=BIOSIS L46
L55(     334)SEA FILE=BIOSIS L47
L56(     334)SEA FILE=BIOSIS L54 OR L55
L57(       0)SEA FILE=CABA L46
L58(     712)SEA FILE=CABA L47
L59(     712)SEA FILE=CABA L57 OR L58
L60(       0)SEA FILE=FSTA L46
L61(      19)SEA FILE=FSTA L47
L62(      19)SEA FILE=FSTA L60 OR L61
L63(       0)SEA FILE=PQSCITECH L46
L64(     199)SEA FILE=PQSCITECH L47
L65(     199)SEA FILE=PQSCITECH L63 OR L64
L66(       3)SEA FILE=TOXCENTER L46
L67(     268)SEA FILE=TOXCENTER L47
L68(     269)SEA FILE=TOXCENTER L66 OR L67
L69(       0)SEA FILE=EMBASE L46
L70(     127)SEA FILE=EMBASE L47
L71(     127)SEA FILE=EMBASE L69 OR L70
L72(       0)SEA FILE=ESBIOBASE L46
L73(      38)SEA FILE=ESBIOBASE L47
L74(      38)SEA FILE=ESBIOBASE L72 OR L73
L75(       3)SEA FILE=HCAPLUS L46
L76(     263)SEA FILE=HCAPLUS L47
L77(     263)SEA FILE=HCAPLUS L75 OR L76
L78(       0)SEA FILE=SCISEARCH L46
L79(     335)SEA FILE=SCISEARCH L47
L80(     335)SEA FILE=SCISEARCH L78 OR L79
L81(    3346)SEA L46 OR L47
L82(     545)SEA FILE=MEDLINE L50 AND TOX/Q
L83(     315)SEA FILE=AGRICOLA L53 AND TOX/Q
L84(     255)SEA FILE=BIOSIS L56 AND TOX/Q
L85(     461)SEA FILE=CABA L59 AND TOX/Q
L86(      17)SEA FILE=FSTA L62 AND TOX/Q
L87(     112)SEA FILE=PQSCITECH L65 AND TOX/Q
L88(     214)SEA FILE=TOXCENTER L68 AND TOX/Q
L89(     121)SEA FILE=EMBASE L71 AND TOX/Q
L90(      28)SEA FILE=ESBIOBASE L74 AND TOX/Q
L91(     175)SEA FILE=HCAPLUS L77 AND TOX/Q
L92(     249)SEA FILE=SCISEARCH L80 AND TOX/Q
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L93(      2492)SEA L81 AND TOX/Q
L94(       518)SEA FILE=MEDLINE L50 AND RES/Q
L95(       415)SEA FILE=AGRICOLA L53 AND RES/Q
L96(       326)SEA FILE=BIOSIS L56 AND RES/Q
L97(       699)SEA FILE=CABA L59 AND RES/Q
L98(        18)SEA FILE=FSTA L62 AND RES/Q
L99(       134)SEA FILE=PQSCITECH L65 AND RES/Q
L100(      201)SEA FILE=TOXCENTER L68 AND RES/Q
L101(      106)SEA FILE=EMBASE L71 AND RES/Q
L102(       31)SEA FILE=ESBIOBASE L74 AND RES/Q
L103(      160)SEA FILE=HCAPLUS L77 AND RES/Q
L104(      260)SEA FILE=SCISEARCH L80 AND RES/Q
L105(     2868)SEA L81 AND RES/Q
L106(      581)SEA FILE=MEDLINE L47
L107(      401)SEA FILE=MEDLINE L106 AND FATE/Q
L108(      469)SEA FILE=AGRICOLA L47
L109(      245)SEA FILE=AGRICOLA L108 AND FATE/Q
L110(      334)SEA FILE=BIOSIS L47
L111(      183)SEA FILE=BIOSIS L110 AND FATE/Q
L112(      712)SEA FILE=CABA L47
L113(      327)SEA FILE=CABA L112 AND FATE/Q
L114(       19)SEA FILE=FSTA L47
L115(        6)SEA FILE=FSTA L114 AND FATE/Q
L116(      199)SEA FILE=PQSCITECH L47
L117(       83)SEA FILE=PQSCITECH L116 AND FATE/Q
L118(      268)SEA FILE=TOXCENTER L47
L119(      166)SEA FILE=TOXCENTER L118 AND FATE/Q
L120(      127)SEA FILE=EMBASE L47
L121(       51)SEA FILE=EMBASE L120 AND FATE/Q
L122(       38)SEA FILE=ESBIOBASE L47
L123(       16)SEA FILE=ESBIOBASE L122 AND FATE/Q
L124(      263)SEA FILE=HCAPLUS L47
L125(      165)SEA FILE=HCAPLUS L124 AND FATE/Q
L126(      335)SEA FILE=SCISEARCH L47
L127(      188)SEA FILE=SCISEARCH L126 AND FATE/Q
L128(     1831)SEA L47 AND FATE/Q
L129(      581)SEA FILE=MEDLINE L47
L130(      556)SEA FILE=MEDLINE L129 AND ECO/Q
L131(      469)SEA FILE=AGRICOLA L47
L132(      433)SEA FILE=AGRICOLA L131 AND ECO/Q
L133(      334)SEA FILE=BIOSIS L47
L134(      334)SEA FILE=BIOSIS L133 AND ECO/Q
L135(      712)SEA FILE=CABA L47
L136(      707)SEA FILE=CABA L135 AND ECO/Q
L137(       19)SEA FILE=FSTA L47
L138(       17)SEA FILE=FSTA L137 AND ECO/Q
L139(      199)SEA FILE=PQSCITECH L47
L140(      142)SEA FILE=PQSCITECH L139 AND ECO/Q
L141(      268)SEA FILE=TOXCENTER L47
L142(      245)SEA FILE=TOXCENTER L141 AND ECO/Q
L143(      127)SEA FILE=EMBASE L47
L144(      114)SEA FILE=EMBASE L143 AND ECO/Q
L145(       38)SEA FILE=ESBIOBASE L47
L146(       32)SEA FILE=ESBIOBASE L145 AND ECO/Q
L147(      263)SEA FILE=HCAPLUS L47
L148(      198)SEA FILE=HCAPLUS L147 AND ECO/Q
L149(      335)SEA FILE=SCISEARCH L47
L150(      298)SEA FILE=SCISEARCH L149 AND ECO/Q
L151(     3076)SEA L47 AND ECO/Q
L152       581 SEA L82 OR L94 OR L107 OR L130
L153       466 SEA L83 OR L95 OR L109 OR L132
L154       334 SEA L84 OR L96 OR L111 OR L134
L155       711 SEA L85 OR L97 OR L113 OR L136
L156        19 SEA L86 OR L98 OR L115 OR L138
L157       182 SEA L87 OR L99 OR L117 OR L140
L158       265 SEA L88 OR L100 OR L119 OR L142
L159       125 SEA L89 OR L101 OR L121 OR L144
L160        38 SEA L90 OR L102 OR L123 OR L146
L161       248 SEA L91 OR L103 OR L125 OR L148
L162       322 SEA L92 OR L104 OR L127 OR L150
L163      3291 SEA SPE=ON  ABB=ON  PLU=ON  L93 OR L105 OR L128 OR L151
          ---------
L164      3994 SEA SPE=ON  ABB=ON  PLU=ON  L163 OR L45
           SAVE L164 GLYFINALMERG/A
L165      1909 SEA SPE=ON  ABB=ON  PLU=ON  L164 AND 2010-2011/PY
           SAVE L165 GLY201011/A
L166      2085 SEA SPE=ON  ABB=ON  PLU=ON  L164 NOT L165
           SAVE L166 GLY201819/A
E191244C       PRINT WZULEGER@KNOELL.COM N ALL


 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 12:24:27 ON 10 JUL 2019
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Appendix 6: ORIGINAL SEARCH QUERY - Part 3

```
    FILE 'MEDLINE' ENTERED AT 13:55:43 ON 06 JAN 2020
CHARGED TO COST=108689
L1          QUE SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
           GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
           5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
           69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
           OR 1066-51-9
           SAVE TEMP L1 GLY1/Q
L2          QUE SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
           ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
           ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
           AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
            PHOSPHONIC ACID OR 57637-97-5
           SAVE TEMP L2 GLY2/Q
L3          QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
           HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
           IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
           EYE? OR IRRIT? OR SENSI? OR ALLERG?
L4          QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
           GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
           METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
           ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L5          QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
           CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
           OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
           OR HORMON? OR GONAD? OR DISRUPT?
L6          QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
           MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
           PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
           EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
           OCCUPAT?
L7          QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
           MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
           CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
           RISK ASSESSMENT?
L8          QUE SPE=ON  ABB=ON  PLU=ON  (L3 OR L4 OR L5 OR L6 OR L7)
           SAVE TEMP L8 TOX/Q
L9          QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
           OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
           METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
           MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L10         QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
           PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
           HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
           OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L11         QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
           OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L12         QUE SPE=ON  ABB=ON  PLU=ON  (L9 OR L10 OR L11)
           SAVE TEMP L12 RES/Q
L13         QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
           DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
           SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
           AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L14         QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
            OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
           OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
           ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L15         QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
           PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
           HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
           MOVEMENT OR REMOVAL  OR DRINKING WATER OR WATER TREATMENT
           PROCESSES
L16         QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
           NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
           OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
           OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
           PERSISTENCE OR LIGAND
L17         QUE SPE=ON  ABB=ON  PLU=ON  (L13 OR L14 OR L15 OR L16)
           SAVE TEMP L17 FATE/Q
L18         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
           ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
           BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
           EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT?  OR BIODIVERS? OR
           PROTECTION GOALS OR ECO?
L19         QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
           OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
           OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
           OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
           OR ALG? OR CHIRON?
L20         QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
           LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
           INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
           APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L21         QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L22         QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
           FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
           RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
           ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
           PARASITOID
L23         QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
           OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
           OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
           MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
           NITROGEN
L24         QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
           SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
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          ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
          OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
L25         QUE SPE=ON  ABB=ON  PLU=ON  (L18 OR L19 OR L20 OR L21 OR L22
          OR L23 OR L24)
          SAVE TEMP L25 ECO/Q

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 14:08:39 ON 06 JAN 2020

' Final search - publications from 11 July 2019 onwards:

   FILE 'MEDLINE' ENTERED AT 17:48:32 ON 07 JAN 2020
CHARGED TO COST=108689
L1       3389 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L2        185 SEA SPE=ON  ABB=ON  PLU=ON  L1 AND ED>20190710
L3        184 SEA SPE=ON  ABB=ON  PLU=ON  L2 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L4          5 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L5          1 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND ED>20190710
L6          1 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'AGRICOLA' ENTERED AT 17:51:29 ON 07 JAN 2020
CHARGED TO COST=108689
L7       6837 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L8        179 SEA SPE=ON  ABB=ON  PLU=ON  L7 AND ED>20190710
L9        179 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L10         3 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L11         2 SEA SPE=ON  ABB=ON  PLU=ON  L10 AND ED>20190710
L12         2 SEA SPE=ON  ABB=ON  PLU=ON  L11 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'BIOSIS' ENTERED AT 17:52:39 ON 07 JAN 2020
CHARGED TO COST=108689
L13     10344 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L14       249 SEA SPE=ON  ABB=ON  PLU=ON  L13 AND ED>20190710
L15       222 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L16         8 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L17         3 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND ED>20190710
L18         2 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'CABA' ENTERED AT 17:54:08 ON 07 JAN 2020
CHARGED TO COST=108689
L19     18097 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L20       375 SEA SPE=ON  ABB=ON  PLU=ON  L19 AND ED>20190710
L21       375 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L22         5 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L23         2 SEA SPE=ON  ABB=ON  PLU=ON  L22 AND ED>20190710
L24         2 SEA SPE=ON  ABB=ON  PLU=ON  L23 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'FSTA' ENTERED AT 17:55:25 ON 07 JAN 2020
CHARGED TO COST=108689
L25       485 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L26        26 SEA SPE=ON  ABB=ON  PLU=ON  L25 AND ED>20190710
L27        26 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L28         4 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L29         1 SEA SPE=ON  ABB=ON  PLU=ON  L28 AND ED>20190710
L30         1 SEA SPE=ON  ABB=ON  PLU=ON  L29 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'PQSCITECH' ENTERED AT 17:56:15 ON 07 JAN 2020
CHARGED TO COST=108689
L31      5023 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L32       106 SEA SPE=ON  ABB=ON  PLU=ON  L31 AND ED>20190710
L33       100 SEA SPE=ON  ABB=ON  PLU=ON  L32 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L34         1 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L35         0 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND ED>20190710

   FILE 'TOXCENTER' ENTERED AT 17:57:14 ON 07 JAN 2020
CHARGED TO COST=108689
L36     14513 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L37       538 SEA SPE=ON  ABB=ON  PLU=ON  L36 AND ED>20190710
L38       380 SEA SPE=ON  ABB=ON  PLU=ON  L37 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L39        21 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L40         1 SEA SPE=ON  ABB=ON  PLU=ON  L39 AND ED>20190710
L41         1 SEA SPE=ON  ABB=ON  PLU=ON  L40 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'EMBASE' ENTERED AT 17:58:52 ON 07 JAN 2020
CHARGED TO COST=108689
L42      4107 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L43       159 SEA SPE=ON  ABB=ON  PLU=ON  L42 AND ED>20190710
L44       158 SEA SPE=ON  ABB=ON  PLU=ON  L43 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L45         5 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L46         1 SEA SPE=ON  ABB=ON  PLU=ON  L45 AND ED>20190710
L47         1 SEA SPE=ON  ABB=ON  PLU=ON  L46 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'ESBIOBASE' ENTERED AT 18:00:01 ON 07 JAN 2020
CHARGED TO COST=108689
L48      4632 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L49       163 SEA SPE=ON  ABB=ON  PLU=ON  L48 AND ED>20190710
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L50       162 SEA SPE=ON  ABB=ON  PLU=ON  L49 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L51         2 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L52         1 SEA SPE=ON  ABB=ON  PLU=ON  L51 AND ED>20190710
L53         1 SEA SPE=ON  ABB=ON  PLU=ON  L52 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'HCAPLUS' ENTERED AT 18:04:42 ON 07 JAN 2020
CHARGED TO COST=108689
L54     23833 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L55       688 SEA SPE=ON  ABB=ON  PLU=ON  L54 AND ED>20190710
L56       338 SEA SPE=ON  ABB=ON  PLU=ON  L55 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L57        59 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L58         1 SEA SPE=ON  ABB=ON  PLU=ON  L57 AND ED>20190710
L59         1 SEA SPE=ON  ABB=ON  PLU=ON  L58 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'SCISEARCH' ENTERED AT 18:07:02 ON 07 JAN 2020
CHARGED TO COST=108689
L60     10481 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q
L61       375 SEA SPE=ON  ABB=ON  PLU=ON  L60 AND ED>20190710
L62       365 SEA SPE=ON  ABB=ON  PLU=ON  L61 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
L63         7 SEA SPE=ON  ABB=ON  PLU=ON  GLY2/Q
L64         4 SEA SPE=ON  ABB=ON  PLU=ON  L63 AND ED>20190710
L65         4 SEA SPE=ON  ABB=ON  PLU=ON  L64 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, TOXCENTER, EMBASE,
   ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 18:14:15 ON 07 JAN 2020
CHARGED TO COST=108689
L66         7 DUP REM L6 L12 L18 L24 L30 L41 L47 L53 L59 L65 (9 DUPLICATES RE
             ANSWER '1' FROM FILE MEDLINE
             ANSWERS '2-3' FROM FILE AGRICOLA
             ANSWER '4' FROM FILE CABA
             ANSWER '5' FROM FILE HCAPLUS
             ANSWERS '6-7' FROM FILE SCISEARCH
          SAVE L66 GLY2SUB/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 18:15:40 ON 07 JAN 2020
CHARGED TO COST=108689
L67      1372 DUP REM L3 L9 L15 L21 L27 L33 L38 L44 L50 L56 L62 (1117 DUPLICA
             ANSWERS '1-184' FROM FILE MEDLINE
             ANSWERS '185-347' FROM FILE AGRICOLA
             ANSWERS '348-482' FROM FILE BIOSIS
             ANSWERS '483-762' FROM FILE CABA
             ANSWERS '763-777' FROM FILE FSTA
             ANSWERS '778-862' FROM FILE PQSCITECH
             ANSWERS '863-1005' FROM FILE TOXCENTER
             ANSWERS '1006-1073' FROM FILE EMBASE
             ANSWERS '1074-1112' FROM FILE ESBIOBASE
             ANSWERS '1113-1234' FROM FILE HCAPLUS
             ANSWERS '1235-1372' FROM FILE SCISEARCH
          SAVE L67 GLY1SUB/A
L68      1372 SEA SPE=ON  ABB=ON  PLU=ON  L66 OR L67
L69      1111 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND TOX/Q
          SAVE L69 GLY12TOX/A
L70      1214 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND RES/Q
          SAVE L70 GLY12RES/A
L71       838 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND FATE/Q
          SAVE L71 GLY1FATE/A
L72      1288 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND ECO/Q
          SAVE L72 GLY1ECO/A
L73      1364 SEA SPE=ON  ABB=ON  PLU=ON  L69 OR L70 OR L71 OR L72
          SAVE L73 GLY2020TOP/A
E007060C     PRINT WZULEGER@KNOELL.COM N ALL

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 19:37:21 ON 07 JAN 2020
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Appendix 7: ORIGINAL SEARCH QUERY - Part 4

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    FILE 'MEDLINE' ENTERED AT 12:25:23 ON 24 FEB 2020
CHARGED TO COST=108689
L1        31 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L2        12 SEA SPE=ON  ABB=ON  PLU=ON  L1 AND 2010-2020/PY
L3        12 SEA SPE=ON  ABB=ON  PLU=ON  L2 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'AGRICOLA' ENTERED AT 12:28:44 ON 24 FEB 2020
CHARGED TO COST=108689
L4         4 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L5         4 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND 2010-2020/PY
L6         4 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'BIOSIS' ENTERED AT 12:30:18 ON 24 FEB 2020
CHARGED TO COST=108689
L7        29 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L8        11 SEA SPE=ON  ABB=ON  PLU=ON  L7 AND 2010-2020/PY
L9        10 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'CABA' ENTERED AT 12:31:01 ON 24 FEB 2020
CHARGED TO COST=108689
L10        5 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L11        3 SEA SPE=ON  ABB=ON  PLU=ON  L10 AND 2010-2020/PY
L12        3 SEA SPE=ON  ABB=ON  PLU=ON  L11 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'FSTA' ENTERED AT 12:31:41 ON 24 FEB 2020
CHARGED TO COST=108689
L13        1 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L14        1 SEA SPE=ON  ABB=ON  PLU=ON  L13 AND 2010-2020/PY
L15        1 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'PQSCITECH' ENTERED AT 12:32:38 ON 24 FEB 2020
CHARGED TO COST=108689
L16       24 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L17        6 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND 2010-2020/PY
L18        3 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'TOXCENTER' ENTERED AT 12:33:06 ON 24 FEB 2020
CHARGED TO COST=108689
L19       84 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L20       29 SEA SPE=ON  ABB=ON  PLU=ON  L19 AND 2010-2020/PY
L21       19 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'EMBASE' ENTERED AT 12:34:03 ON 24 FEB 2020
CHARGED TO COST=108689
L22       48 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
             IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
             C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
             YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
             OR HYDROXYMETHYLPHOSPHONIC ACID
L23       22 SEA SPE=ON  ABB=ON  PLU=ON  L22 AND 2010-2020/PY
L24       22 SEA SPE=ON  ABB=ON  PLU=ON  L23 NOT (COMMENT? OR DISSERTATION
             OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
             T

    FILE 'ESBIOBASE' ENTERED AT 12:35:13 ON 24 FEB 2020
CHARGED TO COST=108689
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L25        15 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
           IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
           C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
           YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
           OR HYDROXYMETHYLPHOSPHONIC ACID
L26        10 SEA SPE=ON  ABB=ON  PLU=ON  L25 AND 2010-2020/PY
L27        10 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T

     FILE 'HCAPLUS' ENTERED AT 12:36:33 ON 24 FEB 2020
CHARGED TO COST=108689
L28       694 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
           IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
           C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
           YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
           OR HYDROXYMETHYLPHOSPHONIC ACID
L29       197 SEA SPE=ON  ABB=ON  PLU=ON  L28 AND 2010-2020/PY
L30        83 SEA SPE=ON  ABB=ON  PLU=ON  L29 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L31        28 SEA SPE=ON  ABB=ON  PLU=ON  L30 NOT PREP/RL

     FILE 'SCISEARCH' ENTERED AT 12:38:57 ON 24 FEB 2020
CHARGED TO COST=108689
L32        67 SEA SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
           IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
           C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
           YDROXYMETHYL OR PHOSPHONOMETHANOL OR HYDROXYMETHYLPHOSPHONATE
           OR HYDROXYMETHYLPHOSPHONIC ACID
L33        22 SEA SPE=ON  ABB=ON  PLU=ON  L32 AND 2010-2020/PY
L34        22 SEA SPE=ON  ABB=ON  PLU=ON  L33 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T

     FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
     EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 12:43:26 ON 24 FEB 2020
CHARGED TO COST=108689
L35        58 DUP REM L3 L6 L9 L12 L15 L18 L21 L24 L27 L31 L34 (76 DUPLICATES
              ANSWERS '1-12' FROM FILE MEDLINE
              ANSWER '13' FROM FILE AGRICOLA
              ANSWER '14' FROM FILE BIOSIS
              ANSWER '15' FROM FILE PQSCITECH
              ANSWERS '16-25' FROM FILE TOXCENTER
              ANSWERS '26-34' FROM FILE EMBASE
              ANSWER '35' FROM FILE ESBIOBASE
              ANSWERS '36-50' FROM FILE HCAPLUS
              ANSWERS '51-58' FROM FILE SCISEARCH
           SAVE TEMP L35 GLYHMPASUBST/A
           D ALL 1-35
           D 36-58

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 12:52:59 ON 24 FEB 2020
```

Appendix 8: ORIGINAL SEARCH QUERY - Part 5a & 5b

```
    FILE 'MEDLINE' ENTERED AT 19:52:46 ON 26 FEB 2020
CHARGED TO COST=108689
L1         QUE SPE=ON  ABB=ON  PLU=ON  35404-71-8 OR METHYLAMINO METHYL
           PHOSPHONIC ACID OR METHYLAMINOMETHYL PHOSPHONIC ACID OR
           METHYLAMINOMETHYLPHOSPHONIC ACID OR N METHYL AMPA OR NSC
           244826 OR PHOSPHONIC ACID METHYLAMINO METHYL OR PHOSPHONIC
           ACID P METHYLAMINO METHYL
           SAVE TEMP L1 MET1/Q
L2         QUE SPE=ON  ABB=ON  PLU=ON  2 3 DIHYDROXY 1 OXOPROPYL AMINOMETH
           YL PHOSPHONIC ACID OR 2 3 DIHYDROXY 1 OXOPROPYL AMINOMETHYLPHOS
           PHONIC ACID OR N GLYCERYL AMPA
           SAVE TEMP L2 MET2/Q
L3         QUE SPE=ON  ABB=ON  PLU=ON  3 OXO 3 PHOSPHONOMETHYL AMINO
           PROPANOIC ACID OR 3 OXO 3 PHOSPHONOMETHYL AMINOPROPANOIC ACID
           OR N MALONYL AMPA
           SAVE TEMP L3 MET3/Q
L4         QUE SPE=ON  ABB=ON  PLU=ON  993-13-5 OR DIHYDROGEN METHYLPHOSPH
           ONATE OR METHANEPHOSPHONIC ACID OR METHYL PHOSPHONIC ACID OR
           METHYLPHOSPHONIC ACID OR NSC 119358 OR PHOSPHONIC ACID METHYL
           OR PHOSPHONIC ACID P METHYL
           SAVE TEMP L4 MET4/Q
L5         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
           HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
           IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
           EYE? OR IRRIT? OR SENSI? OR ALLERG?
L6         QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
           GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
           METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
           ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L7         QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
           CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
           OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
           OR HORMON? OR GONAD? OR DISRUPT?
L8         QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
           MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
           PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
           EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
           OCCUPAT?
L9         QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
           MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
           CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
           RISK ASSESSMENT?
L10        QUE SPE=ON  ABB=ON  PLU=ON  (L5 OR L6 OR L7 OR L8 OR L9)
           SAVE TEMP L10 TOX/Q
L11        QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
           OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
           METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
           MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L12        QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
           PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
           HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
           OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L13        QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
           OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L14        QUE SPE=ON  ABB=ON  PLU=ON  (L11 OR L12 OR L13)
           SAVE TEMP L14 RES/Q
L15        QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
           DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
           SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
           AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L16        QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
            OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
           OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
           ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L17        QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
           PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
           HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
           MOVEMENT OR REMOVAL  OR DRINKING WATER OR WATER TREATMENT
           PROCESSES
L18        QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
           NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
           OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
           OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
           PERSISTENCE OR LIGAND
L19        QUE SPE=ON  ABB=ON  PLU=ON  (L15 OR L16 OR L17 OR L18)
           SAVE TEMP L19 FATE/Q
L20        QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
           ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
           BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
           EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT?  OR BIODIVERS? OR
           PROTECTION GOALS OR ECO?
L21        QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
           OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
           OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
           OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
           OR ALG? OR CHIRON?
L22        QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
           LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
           INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
           APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L23        QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L24        QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
           FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
           RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
           ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
           PARASITOID
L25        QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
           OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
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        OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
        MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
        NITROGEN
L26       QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
        SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
        ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
        OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
L27       QUE SPE=ON  ABB=ON  PLU=ON  (L20 OR L21 OR L22 OR L23 OR L24
        OR L25 OR L26)
        SAVE TEMP L27 ECO/Q

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 20:06:32 ON 26 FEB 2020


' Final search - publication year 2010-2020:

   FILE 'MEDLINE' ENTERED AT 10:09:43 ON 27 FEB 2020
CHARGED TO COST=108689
L1        1 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L2        1 SEA SPE=ON  ABB=ON  PLU=ON  L1 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
L3        0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L4        0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L5      199 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L6      198 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
        SAVE TEMP L2 MEDLMET123/A
        SAVE TEMP L6 MEDLMET4/A

   FILE 'AGRICOLA' ENTERED AT 10:18:08 ON 27 FEB 2020
CHARGED TO COST=108689
L7        0 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L8        0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L9        0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L10      91 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L11      91 SEA SPE=ON  ABB=ON  PLU=ON  L10 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
        SAVE TEMP L11 AGRIMET4/A

   FILE 'BIOSIS' ENTERED AT 10:20:50 ON 27 FEB 2020
CHARGED TO COST=108689
L12       1 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L13       1 SEA SPE=ON  ABB=ON  PLU=ON  L12 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
L14       0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L15       0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L16     174 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L17     150 SEA SPE=ON  ABB=ON  PLU=ON  L16 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
        SAVE TEMP L13 BIOSMET123/A
        SAVE TEMP L17 BIOSMET4/A

   FILE 'CABA' ENTERED AT 10:24:39 ON 27 FEB 2020
CHARGED TO COST=108689
L18       0 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L19       0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L20       0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L21      36 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L22      36 SEA SPE=ON  ABB=ON  PLU=ON  L21 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
        SAVE TEMP L22 CABAMET4/A

   FILE 'FSTA' ENTERED AT 10:28:39 ON 27 FEB 2020
CHARGED TO COST=108689
L23       0 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L24       0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L25       0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L26       3 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L27       2 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
        SAVE TEMP L27 FSTAMET4/A

   FILE 'PQSCITECH' ENTERED AT 10:29:50 ON 27 FEB 2020
CHARGED TO COST=108689
L28       0 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L29       0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L30       0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L31      74 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L32      72 SEA SPE=ON  ABB=ON  PLU=ON  L31 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
        SAVE TEMP L32 PQSCIMET4/A

   FILE 'TOXCENTER' ENTERED AT 10:31:16 ON 27 FEB 2020
CHARGED TO COST=108689
L33       6 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L34       4 SEA SPE=ON  ABB=ON  PLU=ON  L33 NOT (COMMENT? OR DISSERTATION
        OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
        T
L35       0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L36       0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L37     455 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L38     353 SEA SPE=ON  ABB=ON  PLU=ON  L37 NOT (COMMENT? OR DISSERTATION
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         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE TEMP L34 TOXCMET123/A
         SAVE TEMP L38 TOXCMET4/A

   FILE 'EMBASE' ENTERED AT 10:34:46 ON 27 FEB 2020
CHARGED TO COST=108689
L39         1 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L40         1 SEA SPE=ON  ABB=ON  PLU=ON  L39 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
L41         0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L42         0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L43       427 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L44       426 SEA SPE=ON  ABB=ON  PLU=ON  L43 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE TEMP L40 EMBAMET123/A
         SAVE TEMP L44 EMBAMET4/A

   FILE 'ESBIOBASE' ENTERED AT 10:38:15 ON 27 FEB 2020
CHARGED TO COST=108689
L45         1 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L46         1 SEA SPE=ON  ABB=ON  PLU=ON  L45 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
L47         0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L48         0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L49        58 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L50        58 SEA SPE=ON  ABB=ON  PLU=ON  L49 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE TEMP L46 ESBIOMET123/A
         SAVE TEMP L50 ESBIOMET4/A

   FILE 'HCAPLUS' ENTERED AT 10:46:20 ON 27 FEB 2020
CHARGED TO COST=108689
L51        11 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L52         4 SEA SPE=ON  ABB=ON  PLU=ON  L51 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
L53         0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L54         0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L55      1187 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L56       616 SEA SPE=ON  ABB=ON  PLU=ON  L55 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE TEMP L52 HCAPMET123/A
         SAVE TEMP L56 HCAPMET4/A

   FILE 'SCISEARCH' ENTERED AT 10:49:48 ON 27 FEB 2020
CHARGED TO COST=108689
L57         1 SEA SPE=ON  ABB=ON  PLU=ON  MET1/Q AND 2010-2020/PY
L58         0 SEA SPE=ON  ABB=ON  PLU=ON  MET2/Q AND 2010-2020/PY
L59         0 SEA SPE=ON  ABB=ON  PLU=ON  MET3/Q AND 2010-2020/PY
L60       329 SEA SPE=ON  ABB=ON  PLU=ON  MET4/Q AND 2010-2020/PY
L61       329 SEA SPE=ON  ABB=ON  PLU=ON  L60 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
L62         1 SEA SPE=ON  ABB=ON  PLU=ON  L57 NOT (COMMENT? OR DISSERTATION
         OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
         T
         SAVE TEMP L62 SCISMET123/A
         SAVE TEMP L61 SCISMET4/A

   FILE 'STNGUIDE' ENTERED AT 10:56:13 ON 27 FEB 2020
CHARGED TO COST=108689

   FILE 'MEDLINE, BIOSIS, TOXCENTER, EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH'
   ENTERED AT 11:06:41 ON 27 FEB 2020
CHARGED TO COST=108689
L63         4 DUP REM L2 L13 L34 L40 L46 L52 L62 (9 DUPLICATES REMOVED)
            ANSWER '1' FROM FILE MEDLINE
            ANSWER '2' FROM FILE TOXCENTER
            ANSWERS '3-4' FROM FILE HCAPLUS
         SAVE L63 MET123SUB/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 11:07:19 ON 27 FEB 2020
CHARGED TO COST=108689
L64      1051 DUP REM L6 L11 L17 L22 L27 L32 L38 L44 L50 L56 L61 (1280 DUPLIC
            ANSWERS '1-198' FROM FILE MEDLINE
            ANSWERS '199-245' FROM FILE AGRICOLA
            ANSWERS '246-306' FROM FILE BIOSIS
            ANSWERS '307-314' FROM FILE CABA
            ANSWERS '315-340' FROM FILE PQSCITECH
            ANSWERS '341-476' FROM FILE TOXCENTER
            ANSWERS '477-722' FROM FILE EMBASE
            ANSWERS '723-726' FROM FILE ESBIOBASE
            ANSWERS '727-1011' FROM FILE HCAPLUS
            ANSWERS '1012-1051' FROM FILE SCISEARCH
         SAVE L64 MET4SUB/A

L65       759 SEA SPE=ON  ABB=ON  PLU=ON  L64 AND TOX/Q
         SAVE L65 MET4TOX/A
L66       627 SEA SPE=ON  ABB=ON  PLU=ON  L64 AND RES/Q
         SAVE L66 MET4RES/A
L67       752 SEA SPE=ON  ABB=ON  PLU=ON  L64 AND FATE/Q
         SAVE L67 MET4FATE/A
L68       806 SEA SPE=ON  ABB=ON  PLU=ON  L64 AND ECO/Q
         SAVE L68 MET4ECO/A
```

```
L69       1018 SEA SPE=ON  ABB=ON  PLU=ON  L65 OR L66 OR L67 OR L68
          SAVE L69 MET4FINAL/A

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 11:45:12 ON 27 FEB 2020
```

' Database Registry (for identification of substance search terms):

```
   FILE 'REGISTRY' ENTERED AT 15:31:27 ON 04 MAY 2020
CHARGED TO COST=108689
L1          1 SEA SPE=ON  ABB=ON  PLU=ON  24569-83-3
          D IDE

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 15:33:34 ON 04 MAY 2020
```

Appendix 9: ORIGINAL SEARCH QUERY - Part 6

```
    FILE 'MEDLINE' ENTERED AT 17:25:56 ON 04 MAY 2020
CHARGED TO COST=108689
L1          QUE SPE=ON  ABB=ON  PLU=ON  24569-83-3 OR 2 METHYL PHOSPHONOMET
            HYL AMINO ACETIC ACID OR 2 METHYL PHOSPHONOMETHYL AMINOACETIC
            ACID OR ACETIC ACID 2 N METHYL N PHOSPHONATOMETHYL AMINO OR
            GLYCINE N METHYL N PHOSPHONOMETHYL OR GLYPHOSATE N METHYL OR
            METHYL GLYPHOSATE
L2          QUE SPE=ON  ABB=ON  PLU=ON  METHYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR METHYL PHOSPHONOMETHYL AMINOACETIC ACID OR N
            METHYL N PHOSPHONOMETHYL GLYCINE OR N METHYLGLYPHOSATE OR N
            PHOSPHONOMETHYL N METHYL GLYCINE OR N PHOSPHONOMETHYL N
            METHYLGLYCINE
L3          QUE SPE=ON  ABB=ON  PLU=ON  L1 OR L2
            SAVE TEMP L3 GLYNMG/Q
L4        10 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L5         7 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND 2010-2020/PY
L6         7 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L6 NMGMEDL/A

    FILE 'AGRICOLA' ENTERED AT 17:30:51 ON 04 MAY 2020
CHARGED TO COST=108689
L7         7 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L8         6 SEA SPE=ON  ABB=ON  PLU=ON  L7 AND 2010-2020/PY
L9         6 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L9 NMGAGRI/A

    FILE 'BIOSIS' ENTERED AT 17:32:38 ON 04 MAY 2020
CHARGED TO COST=108689
L10       22 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L11        7 SEA SPE=ON  ABB=ON  PLU=ON  L10 AND 2010-2020/PY
L12        6 SEA SPE=ON  ABB=ON  PLU=ON  L11 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L12 NMGBIOS/A

    FILE 'CABA' ENTERED AT 17:36:02 ON 04 MAY 2020
CHARGED TO COST=108689
L13       41 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L14       16 SEA SPE=ON  ABB=ON  PLU=ON  L13 AND 2010-2020/PY
L15       16 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L15 NMGCABA/A

    FILE 'FSTA' ENTERED AT 17:37:34 ON 04 MAY 2020
CHARGED TO COST=108689
L16        2 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L17        2 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND 2010-2020/PY
L18        2 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L18 NMGFSTA/A

    FILE 'PQSCITECH' ENTERED AT 17:38:33 ON 04 MAY 2020
CHARGED TO COST=108689
L19       12 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L20        6 SEA SPE=ON  ABB=ON  PLU=ON  L19 AND 2010-2020/PY
L21        6 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L21 NMGPQSCI/A

    FILE 'TOXCENTER' ENTERED AT 17:41:26 ON 04 MAY 2020
CHARGED TO COST=108689
L22       39 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L23       27 SEA SPE=ON  ABB=ON  PLU=ON  L22 AND 2010-2020/PY
L24       19 SEA SPE=ON  ABB=ON  PLU=ON  L23 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L24 NMGTOXC/A

    FILE 'EMBASE' ENTERED AT 17:44:29 ON 04 MAY 2020
CHARGED TO COST=108689
L25       10 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L26        7 SEA SPE=ON  ABB=ON  PLU=ON  L25 AND 2010-2020/PY
L27        7 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L27 NMGEMBA/A

    FILE 'ESBIOBASE' ENTERED AT 17:45:52 ON 04 MAY 2020
CHARGED TO COST=108689
L28       12 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L29        8 SEA SPE=ON  ABB=ON  PLU=ON  L28 AND 2010-2020/PY
L30        8 SEA SPE=ON  ABB=ON  PLU=ON  L29 NOT (COMMENT? OR DISSERTATION
            OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
            T
            SAVE TEMP L30 NMGESBIO/A

    FILE 'HCAPLUS' ENTERED AT 17:47:33 ON 04 MAY 2020
CHARGED TO COST=108689
L31      120 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L32       57 SEA SPE=ON  ABB=ON  PLU=ON  L31 AND 2010-2020/PY
L33       27 SEA SPE=ON  ABB=ON  PLU=ON  L32 NOT (COMMENT? OR DISSERTATION
```

```
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE TEMP L33 NMGHCAP/A

   FILE 'SCISEARCH' ENTERED AT 17:50:06 ON 04 MAY 2020
CHARGED TO COST=108689
L34         28 SEA SPE=ON  ABB=ON  PLU=ON  L1 OR L2
L35         12 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND 2010-2020/PY
L36         12 SEA SPE=ON  ABB=ON  PLU=ON  L35 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE TEMP L36 NMGSCIS/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 17:53:27 ON 04 MAY 2020
CHARGED TO COST=108689
L37         46 DUP REM L6 L9 L12 L15 L18 L21 L24 L27 L30 L33 L36 (70 DUPLICATE
             ANSWERS '1-7' FROM FILE MEDLINE
             ANSWERS '8-11' FROM FILE AGRICOLA
             ANSWER '12' FROM FILE BIOSIS
             ANSWERS '13-22' FROM FILE CABA
             ANSWER '23' FROM FILE PQSCITECH
             ANSWERS '24-30' FROM FILE TOXCENTER
             ANSWERS '31-32' FROM FILE ESBIOBASE
             ANSWERS '33-46' FROM FILE HCAPLUS
          SAVE L37 GLYNMGSUBST/A
          D COST FUL
          D ALL 1-32
          D 33-46

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 20:54:50 ON 04 MAY 2020
```

Literature Review Report

Scientific peer-reviewed open literature covering the publication period of January 2020 to June 2020 for the approval of pesticide active substance glyphosate and metabolites

as under Article 8(5) of Regulation (EC) No 1107/2009

(Ref. EFSA Journal 2011; 9(2) 2092)

Report number

113898-CA9-1

Author

Anonymous, 2020

Sponsor

[redacted]

Reporting Date

20-October-2020

Date of search(es):

02-July-2020

Content

[redacted]

[redacted]

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[redacted]

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Disclaimer

The information contained herein has been obtained from sources believed to be the most reliable. Every effort has been made to ensure completeness of data. However, no database search can be completely comprehensive, and it is possible that relevant documents have been omitted.

All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

1 Summary

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

In addition, a recommendation by the Assessment Group on Glyphosate (AGG)[5] on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 63) for more details.

This Literature Review Report summarizes the search and evaluation of glyphosate public literature, covering the publication period of January 2020 to June 2020, as requested by the AGG in their letter dated 10-July-2020, subject "Glyphosate: Check of completeness of the supplementary dossier for renewal of approval under Commission Implementing Regulation (EU) No 844/2012", section 2: Elements to be submitted in accordance with Article 11(5) of Regulation (EU) No 844/2012, point 23.

The literature search was conducted accessing 11 bibliographic databases via the service provider STN.

852 articles in total were identified upon removal of duplicates within the current search (January 2020 – June 2020) and articles found already in the previous search (January 2010 – December 2019[6]).
All 852 articles were subsequently assessed for their relevance at title/abstract level ("rapid assessment" according to the procedure and requirements stated in the EFSA 2092 Guidance Document).

A total of 774 of the 852 articles were identified as "non-relevant" in the rapid assessment (e.g. publications dealing with chemical synthesis, efficacy, analytical methods or publications which are not related to glyphosate or its metabolites) and excluded from further evaluation. Due to the large quantity of data, and as agreed with the AGG, the list of articles and the justification for their non-relevance is provided in a standalone Literature Review Excel File[7] (Document ID: 113898_CA9-1_Literature Review Excel File).

For the remaining 78 articles, identified as potentially "relevant" or of "unclear relevance" in the rapid assessment, the full-text documents[8] were reviewed in detail ("detailed assessment").

[1] (aminomethyl)phosphonic acid (AMPA), N-acetyl-AMPA, N-acetyl-glyphosate, (hydroxymethyl)phosphonic acid (HMPA), N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA, methylphosphonic acid and N-methylglyphosate.
[2] European Food Safety Authority, 2011: *Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) No 1107/2009.* EFSA Journal 2011;9(2):2092. 49 pp, doi:10.2903/j.efsa.2011.2092.
[3] Appendix to EFSA Journal 2011;9(2):2092. *Further guidance on performing and presenting the literature search.* Available online: https://efsa.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.2903/j.efsa.2011.2092&file=efs22092-sup-0001-Appendix.pdf
[4] European Food Safety Authority, 2019. *Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances.* EFSA supporting publication 2019:EN-1612. 49 pp., doi:10.2903/sp.efsa.2019.EN-1612.
[5] On 10th May 2019, the European Commission appointed four Member States (France, Hungary, the Netherlands and Sweden) to act jointly as 'rapporteurs' for the AIR5 process assessment of glyphosate. This group of Member States is known as the Assessment Group on Glyphosate (AGG).
[6] See Literature Review Report 108689-CA9-1 for more details (submitted to the AGG in June 2020).
[7] Please note that the standalone Literature Review Excel File will be submitted on a separate CD-ROM / DVD.
[8] All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

A total of 35 articles of the remaining 78 articles were identified as "non-relevant" in the detailed assessment and were excluded from further evaluation. The list of the articles and the justification for their non-relevance is provided in **Table 38** of this Literature Review Report document.

The remaining 43 articles identified as "relevant" in the detailed assessment were classified according to the EFSA 2092 Guidance Document (EFSA Journal 2011;9(2):2092, Point 5.4.1).

Category A — Articles which provide data for establishing or refining risk assessment parameters.
For all articles of Category A, a reliability assessment was performed as recommended in the EFSA 2092 Guidance Document (GD). Summaries were compiled for Category A articles classified as "reliable" or "reliable with restrictions". The list of these Category A & reliable / reliable with restrictions articles can be found in **Table 32** and **Table 33** of this Literature Review Report document.

Category B — Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
A justification for such decision is provided as recommended in the EFSA 2092 Guidance Document (GD). The list of these Category B articles and the justifications can be found in **Table 34** and **Table 35** of this Literature Review Report document.

Category C — Articles for which relevance cannot be clearly determined.
As recommended in the EFSA 2092 Guidance Document (GD), an explanation is provided why the relevance could not be determined. The list of these Category C articles and the explanations can be found in **Table 36** and **Table 37** of this Literature Review Report document.

The full outcome of the literature evaluation is provided in **Table 1**.

Table 1: Summary of the literature review

Section	Number of articles found	Rapid assessment (title/abstract level)		Detailed assessment (full-text level)	
		non-relevant articles	potentially relevant / unclear relevance	non-relevant articles	relevant articles (Category A+B+C)
Efficacy / Agronomy [a)]	360	360	n.a.	n.a.	n.a.
Analytical methods [a)]	72	72	n.a.	n.a.	n.a.
Other non-relevant categories [b)]	73	73	n.a.	n.a.	n.a.
Ecotoxicology	150	121	29	14	15
E-fate	85	83	2	0	2
Residues	16	15	1	0	1
Toxicology	96	50	46	21	25
Total	**852**	**774**	**78**	**35**	**43**

[a)] Efficacy / Agronomy (e.g. reporting desired effects on organisms to be controlled) and development of analytical methods (artificial measurements) do not provide information useful/required for the environmental or human safety risk assessment.
[b)] The category "other non-relevant categories" covers a wide range of scientific publications which are not related to glyphosate or its metabolites or are not related to exposure of humans or the environment to glyphosate or its metabolites and thus not relevant for the risk assessments.

The full outcome of the relevant articles after detailed (full-text) assessment is provided in **Table 2**.

Table 2: Relevant articles by full-text classified according to the EFSA 2092 GD, Point 5.4.1

	Relevant articles by full-text (EFSA 2092 GD, Point 5.4.1)		
Section	**Category A** [a)]	**Category B** [b)]	**Category C** [c)]
Ecotoxicology	2	13	0
E-fate	2	0	0
Residues	1	0	0
Toxicology	7	18	0
Total	**12**	**31**	**0**

[a)] Category A: Articles, which provide data for establishing or refining risk assessment parameters.
[b)] Category B: Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
[c)] Category C: Articles for which relevance cannot be clearly determined.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

Please refer to **Appendix 2** (page 64) to see the article selection process in detail.

2 Introduction

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA Supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances"*.

In addition, a recommendation by the Assessment Group on Glyphosate (AGG) on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 63) for more details.

In June 2020, a Literature Review Report (Document ID: 108689-CA9-1), summarizing results of the search and evaluation of the glyphosate scientific peer-reviewed open literature published from January 2010 until end of December 2019 was submitted to the AGG as part of the Glyphosate AIR5 dossier. In July 2020 during the dossier completeness check, the AGG requested a top-up search and evaluation for Glyphosate open literature covering the publication period between December 2019 and June 2020.

This present Literature Review Report 113898-CA9-1 summarizes the top-up search and evaluation of glyphosate public literature, covering the publication period of January 2020 to June 2020. The month of December 2019 was already comprehensively covered by the previously submitted Literature Review Report (108689-CA9-1).

The search has been conducted via the online service provider STN (www.stn-international.de) that provides access to a broad range of databases and to published research, journal literature, patents, structures, sequences, properties, and other data.

To offer a comprehensive literature search covering the requirements of the EFSA 2092 Guidance Document eleven databases have been used: AGRICOLA, BIOSIS, CABA, CAPLUS, EMBASE, ESBIOBASE, MEDLINE, TOXCENTER, FSTA, PQSCITECH, and SCISEARCH.

Please refer to **Table 3** for more details on the literature search.

Table 3: Overview of the search conducted for glyphosate and its metabolites

Performed for	Covering publication period	Conducted on
Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	January 2020 – June 2020 (incl. June 2020)	02-July 2020

AMPA = (aminomethyl)phosphonic acid
HMPA = (hydroxymethyl)phosphonic acid

A "focused search for grouped data requirements"[9] have been performed (a combination of a substance basic input parameters, keywords and "search filters" defined for the four technical sections –toxicology, residues, environmental fate, and ecotoxicology).

Please refer to **Chapter 2.2** and **2.3** (pages 14 and 16) for the input parameters, keywords and search filters used in the literature search.

Regarding details on the bibliographic databases used in the literature search, please refer to **Chapter 2.1** (**Table 4**).

Regarding the number of articles retrieved in the literature search, please refer to **Chapter 2.1** (**Table 5**).

For the relevance and reliability assessment, please refer to **Chapter 2.4** and **2.5** (pages 19 and 22).

For the full outcome of the literature search for the individual technical sections, please refer to **Chapter 3** (page 27).

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[9] Citation from the EFSA 2092 Guidance Document: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

2.1 Bibliographic databases used in the literature search

Table 4: Overview of the databases used in the literature search

Data requirement(s) captured in the search	**Details of the search(es)**			
	1. AGRICOLA	**2. BIOSIS**	**3. CABA**	**4. CAPLUS**
Justification for choosing the source:	Provides literature from agriculture and related fields, e.g. biology, biotechnology, botany, ecology etc.	Provides the most comprehensive and largest life science literature, e.g. biosciences, biomedicine etc.	Provides literature from agriculture and related sciences, e.g. biotechnology, forestry, veterinary medicine etc.	Provides literature from chemistry and related fields, e.g. biochemistry, chemical engineering etc.
Number of records in the database at the time of search:	> 6.7 million (09/2019)	> 27.8 million (04/2019)	> 8.9 million (05/2018)	> 50.7 million (08/2019)
Database update:	Monthly	Weekly	Weekly	Daily updates bibliographic data; weekly updates indexing data
Date of the search:	02-July-2020	02-July-2020	02-July-2020	02-July-2020
Database covers records:	1970-present	1926-present	1973-present	1907-present and more than 180,000 pre-1907
Date of the latest database update:	10-June-2020	01-July-2020	01-July-2020	01-July-2020
Language limit:	No	No	No	No
Document types <u>excluded</u> that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	258	321	467	364

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	**Details of the search(es)**		
	5. MEDLINE	**6. EMBASE**	**7. TOXCENTER**
Justification for choosing the source:	Provides literature from every area of medicine.	Provides literature from biomedicinal and pharmaceutical fields, e.g. bioscience, biochemistry, human medicine, forensic science, paediatrics, pharmacy, pharmacology, drug therapy, psychiatry, public health, biomedical engineering, environmental science.	Provides literature on pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals.
Number of records in the database at the time of search:	> 30 million (08/2019)	> 36.4 million (08/2019)	> 14.4 million (08/2019)
Database update:	Six times each week, with an annual reload	Daily	Weekly
Date of the search:	02-July-2020	02-July-2020	02-July-2020
Database covers records:	1946-present	1974-present	1907-present
Date of the latest database update:	01-July-2020	01-July-2020	30-June-2020
Language limit:	No	No	No
Document types <u>excluded</u> that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.		
Total number of records retrieved:	207	166	470

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	**Details of the search(es)**			
	8. FSTA	**9. PQSCITECH**	**10. ESBIOBASE**	**11. SCISEARCH**
Justification for choosing the source:	Provides literature on scientific and technological aspects of the processing and manufacture of human food products, e.g. biotechnology, hygiene and toxicology, engineering etc.	Provides a valuable and huge resource of literature (merge of 25 STN databases) from all science areas and technology; from engineering to lifescience.	Provides comprehensive literature on entire spectrum of biological and biosciences research, e.g. microbiology, biotechnology, ecological & environmental sciences, genetics, plant and crop science, toxicology and many more.	Provides one of the largest multidisciplinary scientific literature covering a broad field of sciences, technology, and biomedicine.
Number of records in the database at the time of search:	> 1.4 million (07/2018)	> 32 million (07/2017)	> 7.6 million (07/2018)	> 47.7 million (08/2019)
Database update:	Weekly	Monthly	Weekly	Weekly
Date of the search:	02-July-2020	02-July-2020	02-July-2020	02-July-2020
Database covers records:	1969-present	1962-present	1994-present	1974-present
Date of the latest database update:	25-June-2020	26-June-2020	01-July-2020	29-June-2020
Language limit:	No	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	20	106	206	571

Table 5: Total number of articles retrieved

Scope of the search	After automatic removal of duplicates within the databases in the current search (Jan 2020 – Jun 2020)	After applying search filters [a] within the current search (Jan 2020 – Jun 2020)	After manual removal of duplicates [b] within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019) [c]
January 2020 – June 2020 Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	**1648**	**1638**	**852**

[a] Search filters applied for the four technical sections (residues, environmental fate, toxicology and ecotoxicology). Please refer to **Chapter 2.3** for more details (page 16).

[b] Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[c] Please refer to the Literature Review Report 108689-CA9-1 submitted to the AGG in June 2020.

2.2 Input parameters used in the literature search

The basic input parameters used in the literature search, e.g. IUPAC, chemical name or CAS number, are provided in **Table 6 - Table 15**.

Table 6: Input parameters – active substance Glyphosate

Substance name	Glyphosate Salts: isopropylamine, potassium, ammonium, methylmethanamine
IUPAC / CA name	2-(phosphonomethylamino)acetic acid
CAS number(s)	1071-83-6 Salts: 38641-94-0, 70901-12-1, 39600-42-5, 69200-57-3, 34494-04-7, 114370-14-8, 40465-66-5, 69254-40-6

Table 7: Input parameters – metabolite AMPA

Substance name	AMPA
IUPAC / CA name	(aminomethyl)phosphonic acid
CAS number(s)	1066-51-9

Table 8: Input parameters – metabolite N-acetyl glyphosate

Substance name	N-acetyl glyphosate
IUPAC / CA name	N-acetyl-N-(phosphonomethyl)glycine
CAS number(s)	129660-96-4

Table 9: Input parameters – metabolite N-acetyl AMPA

Substance name	N-acetyl AMPA
IUPAC / CA name	[(acetylamino)methyl]phosphonic acid
CAS number(s)	57637-97-5

Table 10: Input parameters – metabolite HMPA

Substance name	HMPA
IUPAC / CA name	(hydroxymethyl)phosphonic acid
CAS number(s)	2617-47-2

Table 11: Input parameters – metabolite N-methyl AMPA

Substance name	N-methyl AMPA
IUPAC / CA name	[(methylamino)methyl]phosphonic acid
CAS number(s)	35404-71-8

Table 12: Input parameters – metabolite N-glyceryl AMPA

Substance name	N-glyceryl AMPA
IUPAC / CA name	(2,3-dihydroxypropanoylamino)methylphosphonic acid
CAS number(s)	No data

Table 13: Input parameters – metabolite N-malonyl AMPA

Substance name	N-malonyl AMPA
IUPAC / CA name	3-oxo-3-(phosphonomethylamino)propanoic acid
CAS number(s)	no data

Table 14: Input parameters – metabolite methylphosphonic acid

Substance name	methylphosphonic acid
IUPAC / CA name	methylphosphonic acid
CAS number(s)	993-13-5

Table 15: Input parameters – metabolite N-methylglyphosate

Substance name	N-methylglyphosate
IUPAC / CA name	2-[methyl(phosphonomethyl)amino]acetic acid
CAS number(s)	24569-83-3

2.3 Keywords and search filters used in the literature search

The approach used for the search was the "focused search for grouped data requirements"[10], which combines the active substance and metabolite basic input parameters, keywords and search filters defined for each technical section. Please refer to **Table 16** for more details on the keywords used and to **Table 17 - Table 20** for the search filters.

Table 16: Keywords used for the active substance glyphosate and its metabolites

Gly1: Glyphosate and AMPA	glyphosat? OR glifosat? OR glyfosat? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR 69254-40-6 OR aminomethyl phosphonic OR aminomethylphosphonic OR 1066-51-9
Gly2: N-acetyl glyphosate and N-acetyl AMPA	2 acetyl phosphonomethyl amino acetic acid OR n acetyl glyphosate OR n acetylglyphosate OR n acetyl n phosphonomethyl glycine OR 129660-96-4 OR n acetyl ampa OR acetylamino methyl phosphonic acid OR acetylaminomethyl phosphonic acid OR 57637-97-5
Gly 3: HMPA	2617-47-2 OR hydroxymethanephosphonic acid OR hydroxymethyl phosphonate OR hydroxymethylphosphonate OR hydroxymethyl phosphonic acid OR hydroxymethylphosphonic acid OR methanehydroxyphosphonic acid OR phosphonic acid(1w)hydroxymethyl OR phosphonomethanol
Gly 4: N-methyl AMPA	35404-71-8 OR methylamino methyl phosphonic acid OR methylaminomethyl phosphonic acid OR methylaminomethylphosphonic acid OR n methyl ampa OR nsc 244826 OR phosphonic acid methylamino methyl OR phosphonic acid p methylamino methyl
Gly 4: N-glyceryl AMPA	2 3 dihydroxy 1 oxopropyl aminomethyl phosphonic acid OR 2 3 dihydroxy 1 oxopropyl aminomethylphosphonic acid OR n glyceryl ampa
Gly 4: N-malonyl AMPA	3 oxo 3 phosphonomethyl amino propanoic acid OR 3 oxo 3 phosphonomethyl aminopropanoic acid OR n malonyl ampa
Gly 4: methylphosphonic acid	993-13-5 OR dihydrogen methylphosphonate OR methanephosphonic acid OR methyl phosphonic acid OR methylphosphonic acid OR nsc 119358 OR phosphonic acid methyl OR phosphonic acid p methyl
Gly 5: N-methylglyphosate (NMG)	24569-83-3 OR 2 methyl phosphonomethyl amino acetic acid OR 2 methyl phosphonomethyl aminoacetic acid OR acetic acid 2 n methyl n phosphonatomethyl amino OR glycine n methyl n phosphonomethyl OR glyphosate n methyl OR methyl glyphosate OR methyl phosphonomethyl amino acetic acid OR methyl phosphonomethyl aminoacetic acid OR n methyl n phosphonomethyl glycine OR n methylglyphosate OR n phosphonomethyl n methyl glycine OR n phosphonomethyl n methylglycine

(1w) = proximity operator (this order, up to 1 word between)
AND / OR / NOT = boolean search operators
? = any character(s)

[10] Citation from the EFSA 2092 GD: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

Table 17: Search filters related to the technical section toxicology

Toxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR hazard? OR adverse OR health OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR in vivo OR in vitro OR invivo OR invitro OR mode of action OR skin? OR eye? OR irrit? OR sensi? OR allerg? OR rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR metabolism OR metabolite? OR metabolic OR distribution OR adsorption OR excretion OR elimination OR kinetic OR cytochrome OR enzym? OR gen? OR muta? OR chromos? OR clastogen? OR DNA OR carcino? OR cancer? OR tumor? OR tumour? OR oncog? OR oncol? OR malign? OR immun? OR neur? OR endocrin? OR hormon? OR gonad? OR disrupt? OR reproduct? OR development? OR malform? OR anomal? OR fertil? OR foet? OR fet? OR matern? OR pregnan? OR embryo? OR epidem? OR medical? OR poison? OR exposure OR operator? OR bystander? OR resident? OR worker? OR occupat? biomonitoring OR human exposure OR microbiome OR oxidative stress OR apoptosis OR necrosis OR cytotoxicity OR Polyoxyethyleneamine OR POEA OR surfactant OR risk assessment?

Table 18: Search filters related to the technical section residues

Residues [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
uptake OR translocation OR rumen OR storage stability OR storage OR stability OR metabolic OR metabolism OR breakdown OR nature of residues OR residue? OR magnitude of residues OR process? OR effects of processing OR dessicant OR preharvest OR preemerg? OR ?resistant? OR ?toleran? OR transgenic OR hydroly? OR rotation? OR succeed? OR plant? OR crop? OR feed? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig? OR dietary OR assessment OR risk assessment OR consum? OR exposure

Table 19: Search filters related to the technical section environmental fate

Environmental fate [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
soil OR water OR sediment OR degradat? OR photo? OR soil residues OR soil accumulat? OR soil contaminat? OR mobility OR sorption OR column leaching OR aged residue OR leach? OR lysimeter OR groundwater OR contaminat? OR microb? OR exudation OR rhizosphere OR dissipation OR saturated zone OR hydrolysis OR drift OR run-off OR runoff OR drainage OR volat? OR atmosphere OR long-range transport OR short-range transport OR transport OR micronutrient OR phosphate OR iron OR manganese OR half-life OR halflife OR half-lives OR halflives OR DT50 OR kinetics OR off-site movement OR removal OR drinking water OR water treatment processes OR atmospheric deposition OR tile-drains OR surface water OR monitoring data OR disinfectant OR ozone OR tillage OR infiltration OR hard surface OR rainwater OR rain water OR chelat? OR complex? OR mineralization OR persistence OR ligand

Table 20: Search filters related to the technical section ecotoxicology

Ecotoxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR ecotox? OR ?toxic OR ?toxicity OR hazard OR adverse OR endocrine disrupt? OR bioaccumulate? OR biomagnifi? OR bioconcentration OR poison OR effect OR indirect effect? OR direct effect? OR biodivers? OR protection goals OR eco? OR impact OR population OR OR community OR wildlife OR incident OR wildlife OR incident OR pest OR bird? OR acute OR chronic OR long-term OR mallard OR duck OR quail OR bobwhite OR Anas? OR Colinus? OR wild OR dietary OR aquatic OR fish OR daphni? OR alg? OR chiron? OR sediment dwell? OR benthic OR lemna OR marin? OR estuarine OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR plant AND submerge? OR emerge? OR bee? OR apis OR apidae OR bumble? OR colony OR hive OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR protection OR model? OR vole OR pest OR arthropod? OR beneficials OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR decompos? OR micro organisms OR microorganisms OR microbial OR carbon OR nitrogen OR plant? OR vegetative vigo? OR seedling OR germination OR monocot? OR dicot? OR sewage OR activated sludge OR biodegrad? OR bioaccumulation? OR amphib? OR reptile? OR aquatic plant OR beneficial

2.4 Relevance assessment

After removal of duplicates, the remaining articles were assessed for their relevance. First, at "title / abstract level" (so-called "rapid assessment") and second, at "full-text level" (so called "detailed assessment").
Articles that were identified as "non-relevant" in the rapid assessment were excluded from further evaluation and a justification for their non-relevance was provided.
For articles that were not excluded in the rapid assessment (potentially relevant articles and articles of an unclear relevance), a detailed relevance assessment of a full-text document was performed.
Articles that were identified as "non-relevant" in the detailed assessment were excluded from further evaluation and a justification for their non-relevance was provided.

For both assessments (rapid and detailed) the same criteria for non-relevance were applied (see **Chapter 2.4.1** and **2.4.2**).

2.4.1 Criteria applied for "non-relevance"

Articles identified as "non-relevant" in the rapid and detailed assessments belong to one of the following categories and were excluded from further evaluation. A justification for their non-relevance was provided.

- Publications related to efficacy (resistance related articles, new uses of control of pest / crops) or to agricultural / biological research (crop science, breeding, fertilization, tillage, fundamental plant physiology / micro- / molecular biology).
- Publications dealing with analytical methods / development.
- Publications describing new methods of synthesis (discovery / developments) or other aspects of basic (organic / inorganic) chemistry.
- Patents.
- Wastewater treatment.
- Abstracts referring to a conference contribution that does not contain sufficient data / information for regulatory risk assessment.
- Publications focusing on genetically modified organisms / transgenic crops; no data directly relevant to glyphosate evaluation (e.g. crop compositional analysis, gene flow, protein characterization).
- Publications where glyphosate or a relevant metabolite were not the focus of the publication.
- Secondary information including scientific and regulatory reviews[11].
- Articles dealing with political / socio / economic analysis.
- Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity).
- Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes.
- Findings not related to ecotoxicology, toxicology, residues, and environmental fate.
- Publications not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).

[11] Reviews have been partly evaluated on full text level as well – case by case decision.

- Publications dealing with a Roundup[12] formulation / other glyphosate formulations that is not the representative formulation for the AIR5 dossier and thus not relevant to the EU glyphosate renewal.
- Publications dealing with general pesticide exposures (not glyphosate specific).
- Publications generating endpoints that are not relatable to the EU level regulatory risk assessment (e.g. findings based on enzyme, cellular and molecular level etc.).
- Opinion articles where no new data is provided that can be used for the EU regulatory risk assessment.

2.4.2 Additional criteria for articles on the health and exposure of glyphosate

The scientific literature on the health effects of glyphosate can be subdivided in two main parts:

- Articles containing data on glyphosate acid and salts and on the reference glyphosate formulation MON 52276, and
- Articles only containing data on glyphosate formulations and/or co-formulants that have a composition different from that of the reference formulation MON 52276.

In the case of articles only relating to glyphosate formulations *in vitro* testing with the exception of cell/tissue systems[13] that are likely to come in direct contact with formulations and glyphosate formulations containing other active ingredients are excluded. The reason for the exclusion of *in vitro* testing of formulations to assess health effects as a result of systemic exposure is the presence of surfactants which produce cell toxicity based on the destabilization of the cell membrane and the mitochondrial membrane thus masking the specific toxicity of glyphosate. The toxicity of the co-formulants in combination with glyphosate is dependent on the concentration and the nature of the co-formulants and can be addressed on a case-by-case basis during the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

In the relevance of glyphosate data, those articles have been considered as not relevant (and reliable) for the assessment for systemic toxicity when only *in vitro* results are presented with glyphosate concentrations above 1 mM. This is because it is physiologically not possible to attain such concentrations in standard regulatory *in vivo* testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in *in vivo* test systems. It thus makes no sense to include such data in the risk assessment of glyphosate. Exceptions can be made in the event of direct contact with formulations resulting in localized effects, but then there is the contribution of the toxicity of the co-formulants which can be better addressed in the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

[12] Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contains a surfactant polyethoxylated tallow amine (also polyoxyethyleneamine, POEA) which is not permitted for use in the EU. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in articles dealing with POEA based Roundup formulations cannot be related to the representative formulation MON 52276 which is quaternary-ammonium based (and not POEA based).

[13] Glyphosate-based herbicides (GBH) contain surfactants that destabilize the cell membrane and the mitochondrial membrane and thus produce a toxicity that is not representative for glyphosate (see Levine S. L. et al, *Cell Biol. Toxicol. (2007) 23:385-400*). This has been clearly demonstrated in the scientific literature and also in some papers reviewed for this submission where in vitro glyphosate toxicity is compared against that of GBH and surfactants.

The limit of 1 mM has been based on the single dose oral pharmacokinetic data of a formulation containing 71.7% w/w glyphosate where an oral dose of 1,430 mg/kg bw in the rat gives plasma levels of 38.1 µg/mL or 0.225 mM after 2 hours. When extrapolated linearly (which is possible for glyphosate because it is not subject to hepatic metabolism) this gives plasma levels of 53.3 µg/mL or 0.315 mM at 2 hours after oral intake of 2,000 mg/kg bw and 107 µg/mL or 0.630 mM at 2 hours after oral intake of 4,000 mg/kg bw. A systemic concentration of glyphosate of 1 mM would then represent an oral dose of more than 6,000 mg/kg bw which is completely unreasonable for repeat dose experimental *in vivo* testing under today's OECD test guidelines. The ADI for glyphosate of 0.5 mg/kg bw/day corresponds with a daily systemic concentration of 0.17 µg/mL or 1 µM when a 60 kg person with 36 L extracellular fluid is considered with a glyphosate oral bioavailability of 20%. The daily systemic dose of glyphosate on the day of application (i.e. highest exposure day), based on the geometric mean of 3.2 µg/L in urine, of glyphosate applicators in the US is approx. 0.0001 mg/kg bw/day (Acquavella, 2004[14]) which is 1000 times less than the systemic dose (0.1 mg/kg bw) corresponding with the ADI oral dose of 0.5 mg/kg bw with 20% oral bioavailability.

Many articles that have been considered relevant for the risk assessment of glyphosate and have been assessed for reliability on full text basis, contain experimental data as well on glyphosate as such as on formulations (different from MON 52276) and co-formulants. In such cases, only the toxicology data pertinent to glyphosate and to the reference formulation (if that can be clearly stated by the author of the article) are summarized and discussed. In the case of articles on exposure monitoring and epidemiology, exposure to glyphosate formulations are considered.

2.4.3 Categorization of "relevant" articles at full-text level

Articles that were not excluded in the detailed assessment (see **Chapter 2.4.1** and **2.4.2**) were categorized as recommended in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092, Point 5.4.1.

Category A *Studies that provide data for establishing or refining risk assessment parameters. These studies should be summarised in detail following the subsequent steps of the OECD Guidance documents (OECD, 2005; 2006) and should be considered for reliability.*

Category B Studies that are relevant to the data requirement, but in the opinion of the applicant provide only supplementary information that does not alter existing risk assessment parameters. A justification for such a decision should be provided.

Category C Studies for which relevance cannot be clearly determined. For each of these studies the applicants should provide an explanation of why the relevance of such studies could not be definitively determined.

The list of Category A articles can be found in **Table 32** and **Table 33**. The list of Category B articles and the justifications can be found in **Table 34** and **Table 35**. The list of Category C articles and the explanations can be found in **Table 36** and **Table 37**.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

[14] Acquavella J. F. *et al.* (2004), Environmental Health Perspectives, 112(3), 321-326.

2.5 Reliability assessment

For articles, which were identified, in the detailed assessment, as relevant articles of Category A (see **Chapter 2.4.3**) a reliability assessment was performed. The reliability criteria for each technical section are summarized in **Table 21 - Table 23**.

For relevant articles of Category A that were classified either as reliable or reliable with restrictions, summaries were compiled.
Articles of Category A which were classified as non-reliable were downgraded to articles of Category B and justification for such a decision was provided.

Table 21: Reliability criteria for ecotoxicology, environmental fate and residues

Applied for	**Reliability criteria**
Ecotoxicology, Environmental Fate, Residues	For guideline-compliant studies (GLP studies): OECD, OPPTS, ISO, and others. The validity/quality criteria listed in the corresponding guidelines are met.
Ecotoxicology, Environmental Fate, Residues	(No) previous exposure to other chemicals is documented (where relevant).
Ecotoxicology	For aquatic studies, the test substance is dissolved in water or where a carrier is required, it is appropriate (non-toxic) and a carrier control / positive control is considered in the test design.
Environmental Fate, Residues	The test substance is dissolved in water or non-toxic solvent.
Ecotoxicology, Environmental Fate, Residues	Test item is sufficiently documented, and reported (i.e. purity, source, content, storage conditions).
Ecotoxicology	For tests including vertebrates, compliance of the batches used in toxicity studies compared to the technical specification.
Ecotoxicology	Species used in the experiment are clearly reported, including source, experimental conditions (where relevant): strain, adequate age/life stage, body weight, acclimatization, temperature, pH, oxygen (dissolved oxygen for aquatic tests) content, housing, light conditions, humidity (terrestrial species) incubation conditions, feeding.
Ecotoxicology	The validity criteria from relevant test guidelines can be extrapolated across different species but not necessarily across different test designs. If different, then the nature of the difference and impact should ideally be discussed.
Ecotoxicology, Environmental Fate, Residues	Only glyphosate or its metabolites is the test substance (excluding mixture), and information on application of the test substance is described.
Ecotoxicology, Environmental Fate, Residues	The endpoint measured can be considered a consequence of glyphosate (or a glyphosate metabolite).
Ecotoxicology, Environmental Fate, Residues	Study design / test system is well described, including when relevant: concentration in exposure media (dose rates, volume applied, etc.), dilution/mixture of test item (solvent, vehicle) where relevant.
Ecotoxicology, Environmental Fate, Residues	Analytical verifications performed in test media (concentration) / collected samples, stability of the test substance in test medium should be documented.

Applied for	Reliability criteria
Ecotoxicology	The test has been performed in several dose levels (at least 3) including a positive / negative control where relevant.
Ecotoxicology	Suitable exposure throughout the whole exposure period was demonstrated and reported.
Ecotoxicology	A clear concentration response relationship is reported – in studies where the dose response test design is employed.
Ecotoxicology	A sufficient number of animals per group to facilitate statistical analysis reported: mortality in control groups reported, observations/findings in positive/negative control clearly reported (where relevant).
Ecotoxicology, Environmental Fate, Residues	Assessment of the statistical power of the assay is possible with reported data.
Ecotoxicology, Environmental Fate, Residues	Statistical methodology is reported (e.g., checking the plots and confidence intervals).
Ecotoxicology	Description of the observations (including time-points), examinations, and analyses performed, with (where relevant) dissections being well documented.
Ecotoxicology	For terrestrial ecotoxicological studies in the laboratory or the field, the substrates used should be adequately described e.g. nature of substrate i.e. species of leaf or soil type.
Ecotoxicology, Environmental Fate, Residues	Field locations relevant / comparable to European conditions.
Ecotoxicology, Environmental Fate, Residues	Characterization of soil: texture (sandy loam, silty loam, loam, loamy sand), pH (5.5-8.0), cation exchange capacity, organic carbon (0.5-2-5%), bulk density, water retention, microbial biomass (~1% of organic carbon).
Ecotoxicology, Environmental Fate	Other soils where information on characterization by the parameters: pH, texture, CEC, organic carbon, bulk density, water holding capacity, microbial biomass.
Ecotoxicology, Environmental Fate, Residues	For tests including agricultural soils, they should not have been treated with test substance or similar substances for a minimum of 1 year.
Ecotoxicology, Environmental Fate	For soil samples, sampling from A-horizon, top 20 cm layers; soils freshly from field preferred (storage max 3 months at 4 +/- 2°C).
Ecotoxicology, Environmental Fate, Residues	Data on precipitation is recorded.
Environmental Fate	The temperature was in the range between 20-25°C and the moisture was reported.
Environmental Fate	The presence of glyphosate identified in samples were collected from European groundwater, soil, surface waters, sediments or air.
Ecotoxicology	For lab terrestrial studies, the temperature was appropriate to the species being tested and generally should fall within the range between 20-25°C and soil moisture / relative humidity was reported.
Ecotoxicology	For bee studies, temperature of the study should be appropriate to species.
Ecotoxicology	For lab aquatic studies:
	The source and / or composition of the media used should be described.
	The temperature of the water should be appropriate to the species being tested and generally fall within the 15-25ºC.

Applied for	**Reliability criteria**
Ecotoxicology, Residues	The residue data can be linked to a clearly described GAP table, appropriate in the context of the renewal of approval of glyphosate (crop, application method, doses, intervals, PHI).
Ecotoxicology, Environmental Fate, Residues	Analytical results present residues measurements which can be correlated with the existing residues definition of glyphosate, and where relevant its metabolites.
Ecotoxicology, Environmental Fate, Residues	Analytical methods are clearly described; and adequate statement of specificity and sensitivity of the analytical methods is included.
Ecotoxicology	Assessment of the ECX for the width of the confidence interval around the median value; and the certainty on the level of protection offered by the median ECX is reported.
Environmental Fate	Radiolabel characterization: purity, specific activity, location of label is reported.
Environmental Fate	If degradation kinetics are included: data tables / model description / statistical parameters for kinetic fit to be provided.
Environmental Fate, Residues	Monitoring data: description of matrix analysed, and analytical methods to be fully described.
Environmental Fate	Clear description of application rate and relevance to approved uses.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 22: Reliability criteria for toxicology – epidemiology and exposure studies

Reliability criteria – toxicology	
Epidemiology studies	**Exposure studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines/practices	Study in accordance to valid internationally accepted testing guidelines/practices
Study completely described and conducted following scientifically acceptable standards	Study performed according to GLP
	Study completely described and conducted following scientifically acceptable standards
Test substance	**Test substance**
Exposure to formulations with only glyphosate as a.i.	Exposure to formulations with only glyphosate as a.i.
Exposure to formulations with glyphosate combined with other a.i.	Exposure to formulations with glyphosate combined with other a.i.
Exposure to various formulations of pesticides	Exposure to various formulations of pesticides
Study	**Study**
Study design – epidemiological method followed	Study design clearly described
Description of population investigated	Population investigated sufficiently described
Description of exposure circumstances	Exposure circumstances sufficiently described
Description of results	Sampling scheme sufficiently documented
Have confounding factors been considered	Analytical method described in detail
Statistical analysis	Validation of analytical method reported
	Monitoring results reported
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 23: Reliability criteria for toxicology – *in vitro* and *in vivo* studies

Reliability criteria – toxicology and metabolism	
***In vitro* studies**	***In vivo* studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines	Study in accordance to valid internationally accepted testing guidelines.
Study performed according to GLP	Study performed according to GLP
Study completely described and conducted following scientifically acceptable standards	Study completely described and conducted following scientifically acceptable standards
Test substance	**Test substance**
Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions)	Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions)
Only glyphosate acid or one of its salts is the tested substance	Only glyphosate acid or one of its salts is the tested substance
AMPA is the tested substance	AMPA is the tested substance
Study	**Study**
Test system clearly and completely described	Test species clearly and completely described
Test conditions clearly and completely described	Test conditions clearly and completely described
Metabolic activation system clearly and completely described	Route and mode of administration described
Test concentrations in physiologically acceptable range (< 1 mM)	Dose levels reported
Cytotoxicity tests reported	Number of animals used per dose level reported
Positive and negative controls	Method of analysis described for analysis test media
Complete reporting of effects observed	Validation of the analytical method
Statistical methods described	Analytical verifications of test media
Historical negative and positive control data reported	Complete reporting of effects observed
Dose-effect relationship reported	Statistical methods described
	Historical control data of the laboratory reported
	Dose-effect relationship reported
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

3 Search results

The full outcome of the literature search and evaluation is provided below.

Table 24: Summary of the literature search – all technical sections

	Number	Justification
Total number of articles retrieved from the search.	3156	n.a.
Total number of articles after removal of duplicates within all databases.	1648	n.a.
Total number of articles after manual removal of duplicates. [a)]	852	n.a.
Number of articles excluded after rapid assessment (title / abstract).	774	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	78	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	35	See Table 38
Number of articles not excluded after detailed assessment. [b)]	43	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	12	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 25: Results of the article selection process for ecotoxicology

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	150	n.a.
Number of articles excluded after rapid assessment (title / abstract).	121	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	29	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	14	See Table 38
Number of articles not excluded after detailed assessment. [b)]	15	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	2	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 26: Results of the article selection process for environmental fate

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	85	n.a.
Number of articles excluded after rapid assessment (title / abstract).	83	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	2	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	0	See Table 38
Number of articles not excluded after detailed assessment. [b)]	2	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	2	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 27: Results of the article selection process for residues

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	16	n.a.
Number of articles excluded after rapid assessment (title / abstract).	15	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	1	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	0	See Table 38
Number of articles not excluded after detailed assessment [b)]	1	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	1	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 28: Results of the article selection process for toxicology

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	96	n.a.
Number of articles excluded after rapid assessment (title / abstract).	50	See the Literature Review Excel File.
Total number of full-text documents assessed in detail	46	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	21	See Table 38
Number of articles not excluded after detailed assessment [b)]	25	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	7	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 29: Results of the article selection process for analytical methods

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	72	n.a.
Number of articles excluded after rapid assessment (title / abstract).	72	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment [b)]	n.a.	n.a.
Number of summaries presented in the dossier [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 30: Results of the article selection process for efficacy / agronomy

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	360	n.a.
Number of articles excluded after rapid assessment (title / abstract).	360	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b)]	n.a.	n.a.
Number of summaries presented in the dossier. [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 31: Results of the article selection process for “other non-relevant categories”

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	73	n.a.
Number of articles excluded after rapid assessment (title / abstract).	73	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b)]	n.a.	n.a.
Number of summaries presented in the dossier. [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jan 2020 – Jun 2020) and entries found already in the previous search (Jan 2010 – Dec 2019). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 32: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
6	CA 5.2.6	Lindberg T. *et al.*	2020	An integrated transcriptomic- and proteomic-based approach to evaluate the human skin sensitization potential of glyphosate and its commercial agrochemical formulations.	Journal of proteomics, (2020) Vol. 217, Art. No. 103647	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
1	CA 5.5	Crump K. *et al.*	2020	Accounting for Multiple Comparisons in Statistical Analysis of the Extensive Bioassay Data on Glyphosate.	Toxicological sciences : an official journal of the Society of Toxicology, (2020) Vol. 175, No. 2, pp. 156-167	5.4.1 case a) relevant and provides data for the risk assessment: A summary is presented in the AIR5 dossier under MCA 5.5./026.
8	CA 5.5	Portier C. J. *et al.*	2020	A comprehensive analysis of the animal carcinogenicity data for glyphosate from chronic exposure rodent carcinogenicity studies.	Environmental health : a global access science source, (2020) Vol. 19, No. 1, pp. 18	5.4.1 case a) relevant and provides data for the risk assessment: A summary is presented in the AIR5 dossier under MCA 5.5./027.
3	CA 5.6	Ganesan S. *et al.*	2020	Absence of glyphosate-induced effects on ovarian folliculogenesis and steroidogenesis.	Reproductive toxicology, (2020) Vol. 96, pp 156-164	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
12	CA 5.8.2	Yahfoufi Z. A. *et al.*	2020	Glyphosate Induces Metaphase II Oocyte Deterioration and Embryo Damage by Zinc Depletion and Overproduction of Reactive Oxygen Species.	Toxicology, (2020) Vol. 439, Art. No. 152466	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
4	CA 5.8.3	Gastiazoro M. P. *et al.*	2020	Glyphosate induces epithelial mesenchymal transition-related changes in human endometrial Ishikawa cells via estrogen receptor pathway.	Molecular and cellular endocrinology, (2020) Vol. 510, Art. No. 110841	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
11	CA 5.8.3	Xia Y. *et al.*	2020	The endoplasmic reticulum stress and related signal pathway mediated the glyphosate-induced testosterone synthesis inhibition in TM3 cells.	Environmental pollution, (2020) Vol. 260, Art. No. 113949	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
7	CA 6.9	Panseri S. *et al.*	2020	Occurrence of perchlorate, chlorate and polar herbicides in different baby food commodities.	Food chemistry, (2020) Vol. 330, Art. No. 127205	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
5	CA 7.1.4.2	Gros P. *et al.*	2020	Leaching and degradation of (13)C2-(15)N-glyphosate in field lysimeters.	Environmental monitoring and assessment, (2020) Vol. 192, No. 2, pp. 127	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
2	CA 7.5	De Polo A. *et al.*	2019	From the traces in the wells of the urban aqueduct network to the subsequent prohibition of the use of glyphosate: the case of an area of high-intensity wine production in the province of Treviso, Veneto.	Igiene e sanita pubblica, (2019) Vol. 75, No. 6, pp. 451-460	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
10	CA 8.1.4	Turhan D. O. *et al.*	2020	Developmental and lethal effects of glyphosate and a glyphosate-based product on Xenopus laevis embryos and tadpoles.	Bulletin of environmental contamination and toxicology, (2020) Vol. 104, No. 2, pp. 173-179	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
9	CA 8.6.2	Rogacz D. *et al.*	2020	Ecotoxicological effects of new C-substituted derivatives of N-phosphonomethylglycine (glyphosate) and their preliminary evaluation towards herbicidal application in agriculture.	Ecotoxicology and environmental safety, (2020) Vol. 194, pp. 110331	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

Table 33: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
1	Crump K. *et al.*	CA 5.5	2020	Accounting for Multiple Comparisons in Statistical Analysis of the Extensive Bioassay Data on Glyphosate.	Toxicological sciences : an official journal of the Society of Toxicology, (2020) Vol. 175, No. 2, pp. 156-167	5.4.1 case a) relevant and provides data for the risk assessment: A summary is presented in the AIR5 dossier under MCA 5.5./026.
2	De Polo A. *et al.*	CA 7.5	2019	From the traces in the wells of the urban aqueduct network to the subsequent prohibition of the use of glyphosate: the case of an area of high-intensity wine production in the province of Treviso, Veneto.	Igiene e sanita pubblica, (2019) Vol. 75, No. 6, pp. 451-460	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
3	Ganesan S. *et al.*	CA 5.6	2020	Absence of glyphosate-induced effects on ovarian folliculogenesis and steroidogenesis.	Reproductive toxicology, (2020) Vol. 96, pp 156-164	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
4	Gastiazoro M. P. *et al.*	CA 5.8.3	2020	Glyphosate induces epithelial mesenchymal transition-related changes in human endometrial Ishikawa cells via estrogen receptor pathway.	Molecular and cellular endocrinology, (2020) Vol. 510, Art. No. 110841	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
5	Gros P. *et al.*	CA 7.1.4.2	2020	Leaching and degradation of (13)C2-(15)N-glyphosate in field lysimeters.	Environmental monitoring and assessment, (2020) Vol. 192, No. 2, pp. 127	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
6	Lindberg T. *et al.*	CA 5.2.6	2020	An integrated transcriptomic- and proteomic-based approach to evaluate the human skin sensitization potential of glyphosate and its commercial agrochemical formulations.	Journal of proteomics, (2020) Vol. 217, Art. No. 103647	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
7	Panseri S. *et al.*	CA 6.9	2020	Occurrence of perchlorate, chlorate and polar herbicides in different baby food commodities.	Food chemistry, (2020) Vol. 330, Art. No. 127205	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
8	Portier C. J. *et al.*	CA 5.5	2020	A comprehensive analysis of the animal carcinogenicity data for glyphosate from chronic exposure rodent carcinogenicity studies.	Environmental health : a global access science source, (2020) Vol. 19, No. 1, pp. 18	5.4.1 case a) relevant and provides data for the risk assessment: A summary is presented in the AIR5 dossier under MCA 5.5./027.
9	Rogacz D. *et al.*	CA 8.6.2	2020	Ecotoxicological effects of new C-substituted derivatives of N-phosphonomethylglycine (glyphosate) and their preliminary evaluation towards herbicidal application in agriculture.	Ecotoxicology and environmental safety, (2020) Vol. 194, pp. 110331	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
10	Turhan D. O. *et al.*	CA 8.1.4	2020	Developmental and lethal effects of glyphosate and a glyphosate-based product on Xenopus laevis embryos and tadpoles.	Bulletin of environmental contamination and toxicology, (2020) Vol. 104, No. 2, pp. 173-179	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
11	Xia Y. *et al.*	CA 5.8.3	2020	The endoplasmic reticulum stress and related signal pathway mediated the glyphosate-induced testosterone synthesis inhibition in TM3 cells.	Environmental pollution, (2020) Vol. 260, Art. No. 113949	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.
12	Yahfoufi Z. A. *et al.*	CA 5.8.2	2020	Glyphosate Induces Metaphase II Oocyte Deterioration and Embryo Damage by Zinc Depletion and Overproduction of Reactive Oxygen Species.	Toxicology, (2020) Vol. 439, Art. No. 152466	5.4.1 case a) relevant and provides data for the risk assessment: A summary for this article is provided.

Table 34: Relevant but supplementary (category B) articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
43	CA 5.1	Zoller O. *et al.*	2020	Urine glyphosate level as a quantitative biomarker of oral exposure.	International journal of hygiene and environmental health, (2020) Vol. 228, Art. No.113526	5.4.1 case b) relevant but supplementary information: This was a study with human volunteers. The trial was designed to ensure comparable exposure levels to glyphosate among participants who consumed diets with low content of glyphosate residue during the 4-day trial, except for the single meal with targeted amount of glyphosate and AMPA corresponding to an intake of 196.8 µg of glyphosate and 1.67 µg of AMPA. Only urine was collected and analysed for glyphosate and AMPA. Blood and faeces were not collected and/or analysed. This goal of the study was to estimate oral glyphosate intake using urinary biomonitoring data. However, the authors recognised that the determination of blood concentrations is necessary to improve human bioavailability data. Comparison of urinary data in humans in this study with those measured in the rat studies suggest that the systemic availability is much lower in humans than in rats and could be about 20-fold lower. However, in the absence of a mass balance, and a very low recovery of glyphosate and AMPA, the data should be considered unreliable. Given the knowledge that orally dosed glyphosate is mostly excreted via the faeces, an appropriate study design to address mass balance could easily have been implemented to make this a robust and informative investigation. Low recovery rates of glyphosate and AMPA suggest a very large capacity for errors. The study design is inadequate to confirm reliability of the findings. The lack of mass balance of analytes, despite common knowledge that orally dosed glyphosate is mostly excreted in faeces, is disappointing, given the ease with which a mass balance could have been assessed. **The article was downgraded to Category B due to its non-reliability.**
37	CA 5.3	Tang Q. *et al.*	2020	Glyphosate exposure induces inflammatory responses in the small intestine and alters gut microbial composition in rats.	Environmental pollution, (2020) Vol. 261, Art. No. 114129	5.4.1 case b) relevant but supplementary information: The rats were gavaged with 0, 5, 50, and 500 mg/kg of body weight glyphosate for 35 continuous days. The different segments of the small intestine were sampled to measure indicators of oxidative stress, ion concentrations and inflammatory responses, and fresh feces were collected for microbiota analysis. The investigation of potential effects on the gut microbiome of ruminants is not a data requirement for the approval of pesticides and suitable test protocols to assess these effects are not specified in the form of official guidance documents. No GLP status stated, no HCD provided and no purity of glyphosate stated. Fundamental parameters to understand animal health and toxicology endpoints are not reported. Therefore the context of the study results can not be interpreted with any degree of certainity. **The article is not reliable.**
16	CA 5.5	Berry C.	2020	Glyphosate and cancer: the importance of the whole picture.	Pest management science, (2020); doi: 10.1002/ps.5834; Online ahead of print.	5.4.1 case b) relevant but supplementary information: The author is providing a general picture of the carcinogenic and genotoxic profile of Glyphosate by commenting the different studies available and the different conclusions made by IARC and Regulatory authorities. There is no evidence in the animals studies to support the IARC conclusion that glyphosate is a probable human carcinogen. The article does not provide any new information.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
24	CA 5.5	Jeon S. *et al.*	2020	Glyphosate influences cell proliferation in vitro.	Frontiers in Life Science, (2020) Vol. 13, No. 1, pp. 54-65	5.4.1 case b) relevant but supplementary information: Glyphosate was tested in vitro at a range of doses to investigate its effects on cell growth and proliferation in human cells. In conclusion, Glyphosate increases the rate of cell growth in human embryonic kidney 293 (HEK293) cells. Glyphosate promotes cell proliferation by activating gene expression of cell cycle regulators in humans in vitro. Useful information but not altering risk assessment and data requirement and difficult to be used because no HCD provided. No positive control were used, no statistics methods were described. Furthermore, no OECD guideline followed, no GLP status stated. **The article is not reliable.**
14	CA 5.6	Ait-Bali Y. *et al.*	2020	Pre- and postnatal exposure to glyphosate-based herbicide causes behavioral and cognitive impairments in adult mice: evidence of cortical ad hippocampal dysfunction.	Archives of toxicology, (2020) Vol. 94, No. 5, pp. 1703-1723	5.4.1 case b) relevant but supplementary information: In vivo study on pre and post natal effects of Roundup on swiss mice at 2 different doses only, no OECD guideline followed, no GLP status stated, no HCD provided. Oral gavage dosing of formulated product is not relevant to real life exposure scenarios. Environmental fate and metabolism for glyphosate active ingredient versus sufractants are different, and oral co-exposures to mammals at the excessively high doses tested in this case are considered irrelevant to human health risk assessment. In addition, insufficient information is provided to determine which formulation was tested and whether it is the glyphosate EU representative formulation.
17	CA 5.6	Cai W. *et al.*	2020	Low-dose Roundup induces developmental toxicity in bovine preimplantation embryos in vitro.	Environmental science and pollution research international, (2020) Vol. 27, No. 14, pp. 16451-16459	5.4.1 case b) relevant but supplementary information: The effects of Roundup at 3 doses was investigated on the bovine preimplantation embryo. Direct dosing of formulated product to fertilized embryos in vitro is not relevant to real life exposure scenarios. Environmental fate, metabolism and pharmaco-kinetics for glyphosate active ingredient versus sufractants are very different, and oral co-exposures to mammals at the excessively high doses tested in this case are considered irrelevant to livestock and human health risk assessments. In addition, insufficient information is provided to determine which formulation was tested and whether it is the glyphosate EU representative formulation. No OECD guideline followed, no GLP status stated, no HCD provided and no positive control.
29	CA 5.7	Neto de Silva K. *et al.*	2020	Glyphosate-based herbicide impairs energy metabolism and increases autophagy in C6 astroglioma cell line.	Journal of toxicology and environmental health. Part A, (2020) Vol. 83, No. 4, pp. 153-167	5.4.1 case b) relevant but supplementary information: In vitro study on the effects of micromolar concentrations of a glyphosate-based herbicide on energy metabolism and mitochondrial mass in astroglioma cell line exposed for 24 h to the herbicide at 3 concentrations below 160 µM. Insufficient information provided to identify which formulation was tested. No positive control was used, no statistics methods were described, no OECD guideline followed, no GLP status stated, no HCD provided. In addition, astrocytes in real life are not co-exposed to the combination of glyphosate + surfactant formulants, based on their very different environmental fates and pharmaco-kinetics.
26	CA 5.8.2	Levine S. L. *et al.*	2020	Review and Analysis of the Potential for Glyphosate to Interact with the Estrogen, Androgen, and Thyroid Pathways.	Pest management science, (2020), DOI 10.1002/ps.5983	5.4.1 case b) relevant but supplementary information: A systematic literature review was performed including US EPA EDSP Tier 1 battery assessment, guideline regulatory studies, ESDP including 5 in vitro and 6 in vivo assays to evaluate the EAT pathways. From the available literature, it was concluded that glyphosate does not have an endocrine disrupting potential through estrogenic, androgenic or steroidogenic activity. The review includes relevant literature which has been used for the ED assessment during the current submission process. It can therefore serve as supporting information, however as a review it does not provide new primary data or alter the risk assessment. Therefore, the review has been classified as a relevant but supplementary only (EFSA 2092 GD Point 5.4.1 category B).

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
30	CA 5.8.2	Parks C. G. *et al.*	2019	Lifetime pesticide use and antinuclear antibodies in male farmers from the agricultural health study	Frontiers in Immunology (2019) Vol. 10, Art. No. 1476	5.4.1 case b) relevant but supplementary information: The development of systemic autoimmunity in response to pesticide exposure was investigated in a retrospective study farmers. Serum antinuclear autoantibodies were measured by immunofluorescence on Hep-2 cells in 668 male farmers. The effect of lifetime use of 46 pesticides (glyphosate among them) on ANA were investigated. The results for glyphosate use demonstrate no increase the risk of farmers developing systemic autoimmunity. This information is useful in a weight of evidence assessment for the measured endpoint, which, however, is not a critical endpoint identified for human health risk assessment of glyphosate.
13	CA 5.9	Abdel-Halim K. Y. *et al.*	2019	Glyphosate and pendimethalin in breast milk samples from Egyptian rural areas: a pilot study for infant's risk assessment	International Journal of Advanced Research, (2019) Vol. 7, No. 9, pp. 991-1002	5.4.1 case b) relevant but supplementary information: This article claims that glyphosate was detected in breast milk. There are several technical issues with this study: 1st: The solubility of glyphosate in toluene is reported as only 36 PPM. The highest sample values the paper claims is just under 30 PPM. So if we had roughly 30 PPM of glyphosate in milk and took 5 mL for analysis then the toluene would have to be capable of solubilizing 150 PPM of glyphosate! 2nd: And this is a key issue – the HPLC method lists an excitation wavelength that is higher than the emission wavelength! There are several studies evaluating whether glyphosate is detectable in cows milk. A study in human breast milk also was conducted and concluded that glyphosate was not detectable. References: 1. Michelle K McGuire, Mark A McGuire, William J Price, Bahman Shafii, Janae M Carrothers, Kimberly A Lackey, Daniel A Goldstein, Pamela K Jensen, John L Vicini, Glyphosate and aminomethylphosphonic acid are not detectable in human milk, The American Journal of Clinical Nutrition, Volume 103, Issue 5, May 2016, Pages 1285–1290, https://doi.org/10.3945/ajcn.115.126854 2. EFSA. (2018). National summary reports on pesticide residue analysis performed in 2016. EFSA Journal, 16(7), 5348. https://doi.org/org/10.2903/sp.efsa.2018.EN-1454 3. EFSA. (2019). The 2017 European Union report on pesticide residues in food. EFSA Journal, 17(6), 5743. https://doi.org/ 10.2903/j.efsa.2019.5743 4. EFSA. (2020). The 2018 European Union report on pesticide residues in food. EFSA Journal, 18(4), e06057. https://doi.org/10.2903/j.efsa.2020.6057 5. FDA. (2018). Pesticide residue monitoring program. Fiscal year 2016 pesticide report. FDA. https://www.fda.gov/Food/FoodborneIllnessContaminants/Pesticides/ucm618247.htm 6. FDA. (2019). Pesticide residue monitoring program fiscal year 2017 pesticide report. https://www.fda.gov/food/pesticides/pesticide-residue-monitoring-2017-report-and-data 7. Ehling, S., & Reddy, T. M. (2015). Analysis of glyphosate and aminomethylphosphonic acid in nutritional ingredients and milk by derivatization with fluorenylmethyloxycarbonyl chloride and liquid chromatography-mass spectrometry. Journal of Agricultural and Food Chemistry, 63(48), 10562-10568. https://doi.org/10.1021/acs.jafc.5b04453 8. NZ Ministry for Primary Industries. (2012). Dairy national chemical contaminants programme - raw milk result summary 2011/12. Retrieved 12/15/2015 from http://www.foodsafety.govt.nz/elibrary/industry/dairy-nccp-results-summary.pdf 9. Steinborn, A., Alder, L., Michalski, B., Zomer, P., Bendig, P., Martinez, S. A., Mol, H. G., Class, T. J., & Costa Pinheiro, N. (2016). Determination of glyphosate levels in breast milk

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						samples from Germany by LC-MS/MS and GC-MS/MS. Journal of Agricultural and Food Chemistry, 64(6), 1414-1421., https://doi.org/10.1021/acs.jafc.5b05852 10. von Soosten, D., Meyer, U., Hüther, L., Dänicke, S., Lahrssen-Wiederholt, M., Schafft, H., Spolders, M., & Breves, G. (2016). Excretion pathways and ruminal disappearance of glyphosate and its degradation product aminomethylphosphonic acid in dairy cows. Journal of Dairy Science, 99(7), 5318-5324. https://doi.org/10.3168/jds.2015-10585 11. Zhao, J., Pacenka, S., Wu, J., Richards, B. K., Steenhuis, T., Simpson, K., & Hay, A. G. (2018). Detection of glyphosate residues in companion animal feeds. Environmental Pollution, 243(Pt B), 1113-1118. https://doi.org/10.1016/j.envpol.2018.08.100 **The article is not reliable.**
18	CA 5.9	Donato F. *et al.*	2020	Exposure to glyphosate and risk of non-Hodgkin lymphoma and multiple myeloma: an updated meta-analysis.	La Medicina del lavoro, (2020) Vol. 111, No. 1, pp. 63-73	5.4.1 case b) relevant but supplementary information: The publication is considered not reliable because there is nothing that has been done in this (or other) meta-analysis to address recall bias, selection bias, and failure to control for confounding factors in the NHL case-control studies. **The article was downgraded to Category B due to its non-reliability.**
19	CA 5.9	Eddleston M.	2020	Poisoning by pesticides.	Medicine, (2020) Vol. 48, No. 3, pp. 214-217	5.4.1 case b) relevant but supplementary information: This is a review article discussing clinical features and management of pesticide overdoses. The article comments that glyphosate has much lower toxicity in acute overdose than older pesticides and discusses the use of supportive care in these overdoses. Since this describes the management of suicidal overdoses it should not impact the risk assessment / re-registration.
31	CA 5.9	Rajput R. *et al.*	2019	Haemodialysis as an imperative treating modality in severe glyphosate-surfactant poisoning.	Journal, Indian Academy of Clinical Medicine, (2019) Vol. 20, No. 3-4, pp. 224-226	5.4.1 case b) relevant but supplementary information: This is a case report of a patient who developed hyperkalaemia, renal failure and pulmonary edema after a suicidal ingestion of formulated glyphosate. These clinical features are common with large ingestions. Hemodialysis is standard of care in cases such as these. This report raises no new clinical features regarding this type of overdose and should not impact risk assessment / re-registration.
32	CA 5.9	Ren Y. *et al.*	2020	Cases report of gastrointestinal hemorrhage caused by glyphosate herbicides.	Acta Medica Mediterranea, (2020) Vol. 36, No. 3, pp. 1611-1614	5.4.1 case b) relevant but supplementary information: This article describes two patients with GI hemhorrage after formulated glyphosate ingestion. According to the history, the first patient drank excessive amounts of ethanol for a long time, which in and of itself can contribute to GI ulceration and bleeding. He also ingested triazolone. This patient's course appears to be atypical as the patient appears to have been stable on admission, was in the hospital for weeks, underwent multiple endoscopic procedures for 2 weeks after ingestion and later developed significant GI bleeding necessitating a gastrectomy. In formulated glyphosate overdoses, corrosive injury to the GI tract occurs early due to the surfactant. The second patient in this report also presented with corrosive injury to the GI tract which is not unexpected. Since this paper describes suicidal ingestions it should not impact the risk assessment / re-registration.
36	CA 5.9	Soukup S. T. *et al.*	2020	Glyphosate and AMPA levels in human urine samples and their correlation with food consumption: results of the	Archives of toxicology, (2020) Vol. 94, No. 5, pp. 1575-1584	5.4.1 case b) relevant but supplementary information: The authors calculated the intake of glyphosate and AMPA based on urinary concentrations and checked this value against the EU acceptable daily intake (ADI) value for glyphosate. The exposure to glyphosate and AMPA was found to be very low. Quantifiable levels of glyphosate and/or AMPA was detected in 8.3% (25 out or 301) of the participants with the highest reported value (0.63 µg/kg BW) being 0.13% of the ADI.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
				cross-sectional KarMeN study in Germany.		24-hr urine samples were collected from 301 adults for analysis of glyphosate. The study subjects were recruited to be healthy and not taking medications. The glyphosate exposures as a percent of the ADI were calculated. However, unlike previous studies, this calculation was not derived using assumptions for body weight or volume of urine. Rather, ADIs were calculated for each study subject using their own body weight and 24-hr urine excretion. Samples were analyzed using an LC-MS/MS that was modified by the procedure of Jensen *et al.* (1), and 66.5% had neither no detectable glyphosate nor AMPA in urine. Glyphosate and/or AMPA was quantifiable detected in 8.3% of participants with a maximum glyphosate exposure of 0.63 µg/kg BW, which was 0.13% of the ADI. The maximum intake of AMPA + glyphosate corresponded to 0.16% of the ADI. This study also used 24-hr dietary recalls and did rank-order correlations to estimate food sources of glyphosate and AMPA. This was done based solely of the amount of food and not glyphosate content of the food. Nevertheless, they found that consumption of pulses and mushrooms were correlated with glyphosate and AMPA in urine, respectively. Absorbed glyphosate is not metabolized in the body suggesting that ingestion of AMPA per se, not glyphosate, was responsible for urinary AMPA. As a result of their study, the authors concluded that "based on the current risk assessment of glyphosate by EFSA, such exposure levels are not expected to pose any risk to human health. The detected associations with consuming certain foods are in line with reports on glyphosate and AMPA residues in food." References 1. Jensen, P. K., Wujcik, C. E., McGuire, M. K., and McGuire, M. A. (2016) Validation of reliable and selective methods for direct determination of glyphosate and aminomethylphosphonic acid in milk and urine using LC-MS/MS. Journal of Environmental Science and Health. Part. B, Pesticides, Food Contaminants, and Agricultural Wastes 51, 254-259
38	CA 5.9	Uengchuen K. *et al.*	2020	Health risk assessment on the glyphosate exposure of knapsack sprayers.	Indian Journal of Public Health Research and Development, (2020) Vol. 11, No. 3, pp. 2088-2093	5.4.1 case b) relevant but supplementary information: This article describes an assessment tool designed by the researchers to evaluate level of exposure based on PPE use, self-reported symptoms 6 months after use and frequency of use. They found that most farmers used PPE and had minimal symptoms such as burning eyes which may be due to the surfactant in formulations. There were no severe symptoms and no description of long-term outcomes. This descriptive article describes self-reported non-specific symptoms (nausea, headache, rash, burning eyes) in glyphosate users and should not affect the risk assesment / re-registration.
39	CA 5.9	Yang F. *et al.*	2020	Acute obstructive fibrinous laryngotracheobronchitis induced by severe glyphosate surfactant intoxication: A case report.	World journal of emergency medicine, (2020) Vol. 11, No. 2, pp. 125-126	5.4.1 case b) relevant but supplementary information: This is a case report describing a patient who developed fibrinous tracheobronchitis after a suicide attempt with formulated glyphosate. Since the surfactant can cause corrosive injury and the patient had evidence of aspiration, this would be a possible side effect. Since this reflects a suicidal ingestion, it should not impact the risk assessment / re-registration.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
41	CA 5.9	Zhang F. *et al.*	2020	Concentration Distribution and Analysis of Urinary Glyphosate and Its Metabolites in Occupationally Exposed Workers in Eastern China.	International journal of environmental research and public health, (2020) Vol. 17, No. 8, Art. No. 2943	5.4.1 case b) relevant but supplementary information: This study followed workers who were occupationally exposed to glyphosate in a manufacturing facility. They measured ambient air concentrations and then measured urinary concentrations of glyphosate and AMPA and found that the detection rates of glyphosate (>0.020mg/L) and AMPA (>0.010mg/L) were 86.6% (116/134) and 81.3% (109/134), respectively. The median values were 0.292 mg/L and 0.068 mg/L for urinary glyphosate and AMPA. There was variability in exposure based on where the worker was physically in the plant. This study was looking at biomarkers for exposure and makes no health claims regarding thise exposures.
15	CA 8.2.1	Al-Kawaz J. M.	2019	Effect of acute toxicity of glyphosate in gold fish Carassius auratus.	Annals of Tropical Medicine and Public Health, (2019) Vol. 22, No. Special Issue 5, Art No. SP173	5.4.1 case b) relevant but supplementary information: This is a dose-response laboratory study on the 96-h acute toxicity to goldfish (Carassius auratus) with an endpoint of 96-h LC50 = 14.55 ppm. 4 concentrations were tested. Behavioural, morphological and histopathological changes were recorded. No analytical verifications, no control results and no information on origin / any previous exposure of fishes is available. No statistical information provided. In addition, Glyphosate was not sufficiently documented. Fish used in test were collected from fish shops and they were not correctly reported. Previous exposure to pesticides cannot be excluded. **The article was downgraded to Category B due to its non-reliability.**
20	CA 8.2.1	Erhunmwunse N. O. *et al.*	2018	Acute toxicity of glyphosate-based Isopropylamine formulation to juvenile African catfish (Clarias gariepinus).	Nigerian Journal of Basic and Applied Sciences (2018) Vol. 26, No. 2, pp. 97-101	5.4.1 case b) relevant but supplementary information: This is a dose-response laboratory study on the 96-h acute toxicity to African catfish (Clarias gariepinus) juveniles with an endpoint of 96-h LC50 = 300 mg/L. However, there is a lack of analytical verifications of the substance concentration in water. No clear origin of the fishes. Unit of the endpoint is unclear (no information whether the endpoint refers to the formulation, glyphosate or its salt). Test item cannot be identified from the article. Test design stated as being based on total residual chlorine in abstract - but it does state in the methods that OECD (1992) procedure was used, which refers to the OECD 203 acute test guideline from July 1992. Concerning fish loading - if the test employed 60 L aquariums - which cannot be confirmed, the loading is too high (approx. 18 g fish/L) compared to OECD 1992 procedure for acute fish testing of approx 1 g fish/L. **The article was downgraded to Category B due to its non-reliability.**

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
25	CA 8.2.1	Kharat T. L. *et al.*	2016	Effect of glyphosate roundup on oxygen consumption in freshwater fish Rasbora daniconius	Ecoscan, (2016) Vol. 9, No., Spec.Iss., pp. 567-571	5.4.1 case b) relevant but supplementary information: This is a dose-response laboratory study on the 96-h acute toxicity to a local fish species (Rasbora daniconius) with an endpoint of 96-h LC50 = 5.66 mg/L. 7 concentrations were tested. Oxygen consumption was measured in a separate test when fishes are exposed to control, lethal and sub-thel concentration of the formulation in water. Behavioural and morphological observations were also made. There is a lack of analytical verifications. No statistical analysis. Glyphosate was not sufficiently documented, No information given about the control. Other relevant methodological information not provided. Wild-caught fish used in test, previous exposure to pesticides cannot be excluded. No test guideline stated. Fitness of test population unknown. Exposure test conditions, test media preparation, environmental controls - all were not defined / no water quality data reported in the results. Fish weights reported, but as test design not presented, the fish loading and influence on outcome of results cannot be determined. Uncertainity in the results based on errors in the results table i.e. 70% mortality stated to have occurred at the 4.6 mg/L rate, when the text and the report table suggest only 30% mortality. **The article was downgraded to Category B due to its non-reliability.**
33	CA 8.2.1	Sanudi F. *et al.*	2018	Lethal toxicity of glyphosate herbicide on koi carp, cyprinus carpio (Linnaeus, 1758) fingerlings.	Toxicology International, (2018) Vol. 25, No. 2, pp. 139-141	5.4.1 case b) relevant but supplementary information: Bioassay experiments were conducted to determine the lethal toxicity of glyphosate herbicide on Koi carp, Cyprinus carpio fingerlings. The fishes were exposed to different concentrations of glyphosate and mortality was recorded after every 6 h for a period of 96 h. The 96 h LC50 concentration for glyphosate on Koi carp fingerlings was found to be 33.2 mg/L. There is no test item information, nor biological observation data presented to corroborate the findings, in addition no chemical analysis and therefore exposure cannot be confirmed. **The article was downgraded to Category B due to its non-reliability.**
34	CA 8.2.1	Selvarani A. J. *et al.*	2019	Acute toxicity of glyphosate herbicide on Nile tilapia (Oreochromis niloticus)	International Journal of Current Microbiology and Applied Sciences, (2019) Vol. 8, No. 10, pp. 61-68	5.4.1 case b) relevant but supplementary information: This test was performed in a static renewal regime with Nile tilapia (Oreochromis niloticus) exposed to 5 different concentrations of glyphosate (15.33, 30.67, 61.34, 122.68 and 245.36 mg/L) for 96 hours. Mortality was recorded but also the gill, liver and kidney tissues were dissected out. Lack of analytical verifications of the substance concentration in water but exposure medium was changed every 24 h to maintain the desired concentrations. The test item is not identified. There is no chemical analysis. Water quality measurements have / appear to have only been done at the test start. A table is presented, but whether this is starting or duration derived values is unknown. Fish loading during the 96 hr test is excessive. 10 x 100 g fish in 50 litres = 20 g fish / litre. US EPA requires 0.8 g fish/L; OECD requires 1.0 g/L. This study would be considered invalid in the EU and the US for these reasons. **The article was downgraded to Category B due to its non-reliability.**

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
35	CA 8.2.4.2; CA 8.2.6.2	Solis-Gonzalez G. *et al.*	2019	Acute toxicity of N-(phosphonomethyl) glycine herbicide on planktonic microorganisms Artemia franciscana and Microcystis aeruginosa.	TIP Revista Especializada en Ciencias Quimico-Biologicas, (2019) Vol. 22, pp. 1-8	5.4.1 case b) relevant but supplementary information: The aim of this research was to evaluate the median lethal concentration at 24h in Artemia franciscana, as well as the median population inhibitory concentration and the coefficient of form in the cyanobacterium Microcystis aeruginosa in aquatic ecosystems. The calculated endpoint for A. franciscana was 24-h LC50 = 0.31 mg/L and for M. aeruginosa was 72-h ErC50 = 53.95 mg/L. Lack of analytical verifications during the test. Tested concentrations and dissolved oxygen (for invertebrate species) was not reported. For the additional aquatic invertebrate species, mortality was calculated at 24h (instead of at 48h). As raw data are not provided, it is not possible to check the validity criteria of the tests. The endpoints and the performance of the controls cannot be validated. **The article was downgraded to Category B due to its non-reliability.**
28	CA 8.2.6	Nagai T.	2019	Sensitivity differences among seven algal species to 12 herbicides with various modes of action.	Journal of Pesticide Science (2019) Vol. 44, No. 4, pp. 225-232	5.4.1 case b) relevant but supplementary information: For glyphosate no data presented that could impact the endpoints used in the risk assessment as they have been achieved using a method that is not recognised at the EU level. Reference to available data is considered a secondary source and therefore not relevant to EU renewal. Validity criteria not reported. ErC50 were calculated at 96h instead of at 72h. The initial green algae biomass concentration was not reported. The test substance was not clearly identified (purity unclear). Control results are missing.
40	CA 8.2.6	Ye J. *et al.*	2019	The Growth, Apoptosis and Oxidative Stress in Microcystis viridis Exposed to Glyphosate	Bulletin of environmental contamination and toxicology (2019) Vol. 103, No. 4, pp. 585-589	5.4.1 case b) relevant but supplementary information: Provides information on the effects of glyphosate on the growth of Microcystis viridis at 4 different concentrations every 24 h for 10 days but no endpoints are given. The algal growth inhibition test was conducted according to the OECD guideline 201-Freshwater Alga and Cyanobacteria (2011). However, as no raw data and only results in figures were presented, it is not possible to check its validity criteria. No reference substance has been tested. Analytical verifications were performed but it is not clear in the study whether they are only made at the test start or also during the study. Analytically, over a 3 day period, glyphosate is very stable under illuminated conditions. Under 240 hours exposure, it is highly unlikely that the authors could have achieved such high recoveries, hence the thought would be that the measured values presented were initial measured concentrations. The duration of the study is longer than recommended (10 days instead of 3), but growth rate is recorded after 72 h. There is not sufficient information presented to corroborate the findings.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
42	CA 8.2.6.2	Zhang Y. *et al.*	2016	Inhibitory activity of 26 herbicides against the growth of Scenedesmus obliquus	Anhui Nongye Kexue, (2016) Vol. 44, No. 23, pp. 132-133	5.4.1 case b) relevant but supplementary information: The aim of this research was to determine the inhibitory activities of 26 herbicides against the growth of the microalgae Scenedesmus obliquus using an absorption spectrophotometry method. Among the 26 herbicides, glyphosate was categorized as low toxic (72 h EyC50 = 73.9 mg/L) and glyphosate-isopropylammonium (72 h EyC50 = 2.21 mg/L) as moderately toxic. Methodology of the test is poorly described and then only final conclusions are reported. The article was published in non-peer reviewed journal. Lack of analytical verifications during the test. pH not reported. Test substance is not clearly identified and tested rates are not reported. The response variable was given as yield, which may be needed to fulfil specific regulatory requirements in some EU countries. However, the data basis of the endpoint is unclear as it was also stated that inhibition concentration based on biomass was calculated. The inhibition rate was calculated using the absorption of the tested solutions and the conversion factor (cell number vs. absortion) is not known. The strain/ origin of the tested organisms is not suficiently reported. As raw data are not provided, it is not possible to check the validity criteria of the tests. The endpoints and the performance of the controls cannot be validated. **The article was downgraded to Category B due to its non-reliability.**
22	CA 8.2.8	Gonzalez D. *et al.*	2019	Freshwater periphyton response to technical-grade and two commercial formulations of glyphosate.	Ecologia Austral, (2019) Vol. 29, No. 1, pp. 20-27	5.4.1 case b) relevant but supplementary information: The effects of a single glyphosate concentration (3 mg/L; 2, 5 and 9 days after application) provided by different means (pure glyphosate and 2 different formulations) on the structure of the microbial community in a freshwater microcosm were investigated. Pigments concentration, dry weight, ash-free dry weight, and algal density were determined. Effects on the control were provided and analytical verifications were made. An increase of Cyanobacteria and a decrease of algae abundances were registered in all treatments with the herbicide. The effect was greater for the formulations and lower with technical-grade glyphosate, suggesting that additives in the commercial formulations may enhance glyphosate effects. The test is not performed according to any OECD guidance, and no endpoints are given. The study is well written and published in an SCI journal. The article presents results for a microcosm type experiment where by 2 Litre treatment units were established with periphyton grown on substrates from a mesocosm. All substrates were pre-exposed to mesocosm water for 36 days, after which time substrates became colonised. Microbial communities were not assessed. Test water was prepared from centrifuged mesocosm waterand then 5 pre-grown substrate boards were suspecned in each of the three treatments + control. Ther test does not follow a recognised test design and there is some uncertainities with the methods used for identifying species and for example, how were dead diatyoms deteremined. Despite these substrates being naturally colonised, there is no discussion over the zooplankton community that would also have been present on the substrates including / but not limited to rotifers. The influence of other factors on the periphyton assemablages on the substrates is not discussed.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
27	CA 8.2.8	Lu T. *et al.*	2020	Understanding the influence of glyphosate on the structure and function of freshwater microbial community in a microcosm.	Environmental pollution, (2020) Vol. 260, Art. No. 114012	5.4.1 case b) relevant but supplementary information: The effects of single glyphosate concentration (2.5 mg/L, 15 days) on the structure and function of microbial communities in a freshwater microcosm were investigated. This treatment did not significantly alter the physical and chemical condition of the microcosm or the composition of the main species in the community, but the transcriptions of some cyanobacteria were significantly influenced. Under glyphosate stress, the microbial community structure did not change much, but the microbes' function varied a lot. The test is not preformed according to any OECD guidance, but the outcomes on the aquatic microbial community (algae, cyanobacteria) can be relevant for the risk assessment but no endpoints are given. There is a lack of analytical verifications of the product concentration on the artificial medium and that the samples are from a lake and therefore, previous exposure to pesticides cannot be excluded.
23	CA 8.6.	Guo L. *et al.*	2020	Effects of glyphosate and paraquat on root morphology and aboveground growth of Prunus persica seedlings.	Ying yong sheng tai xue bao = The journal of applied ecology, (2020) Vol. 31, No. 2, pp. 524-532	5.4.1 case b) relevant but supplementary information: The aim of the study is to examine the effects of two herbicides (glyphosate and paraquat) on vegetative growth, root structure, root-tip cell mitosis and photosynthesis in peach (Prunus persica) seedlings. The growth of both shoots and roots of the P. persica seedlings was significantly inhibited by glyphosate applied at 2.5 g/L with a plant height decrease of 31. 5% compared to control. Total root length, root surface area, root volume and the number of root tips also decreased compared to the control by 39.5%, 39.5%, 49.8% and 44.6%, respectively. The test does not follow any of the recommended OECD protocols for testing terrestrial plants at the EU level. Furthermore, the test substance is not clearly identified - it is unclear whether it is a product or a technical substance. However, the test item used cannot be related to the EU representative formulation asi it was stated that the product used was a 300 g/L formulation - but no other formulation details are presented. Exposure concentrations in the spray were not confirmed. No endpoints nor apical measurements presented that can be related to an EU level risk assessment for renewal purposes. **The article is not reliable.**
21	CP 10.3.1.1.1	Faita M. R. *et al.*	2020	Glyphosate-based herbicides and Nosema sp. microsporidia reduce honey bee (Apis mellifera L.) survivability under laboratory conditions	Journal of Apicultural Research, (2020) Vol. 59, pp. 332-342	5.4.1 case b) relevant but supplementary information: This is an acute oral toxicity test on bees performed according to the OECD 213. Collected bees in winter and spring were orally exposed to Roundup alone, Nosema spp. spores and a combination of both. 48-h survival after exposure to Glyphosate only (calculated as 0.08 µg a.s./bee, considering an average food consumption of 30 µL/bee) was above 95% for both winter and spring collected bees. Mortality increased when exposed to the mixture with Nosema spp. spores. One single glyphosate concentration and a control was tested. The study is published in a SCI peer-reviewed journal and provides relevant toxicological information on the acute oral risk to bees but no endpoints are given. There are some lacking information: no RF test conducted, no positive control was used, performance of hive was not reported. In addition, RNA profiling not used as an endpoint is EU Annex I renewal ecotox risk assessment and the outcome of the study is not very useful for the risk assessment because the tested rate is sub-lethal.

Table 35: Relevant but supplementary (category B) articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
13	Abdel-Halim K. Y. *et al.*	CA 5.9	2019	Glyphosate and pendimethalin in breast milk samples from Egyptian rural areas: a pilot study for infant's risk assessment	International Journal of Advanced Research, (2019) Vol. 7, No. 9, pp. 991-1002	5.4.1 case b) relevant but supplementary information: This article claims that glyphosate was detected in breast milk. There are several technical issues with this study: 1st: The solubility of glyphosate in toluene is reported as only 36 PPM. The highest sample values the paper claims is just under 30 PPM. So if we had roughly 30 PPM of glyphosate in milk and took 5 mL for analysis then the toluene would have to be capable of solubilizing 150 PPM of glyphosate! 2nd: And this is a key issue – the HPLC method lists an excitation wavelength that is higher than the emission wavelength! There are several studies evaluating whether glyphosate is detectable in cows milk. A study in human breast milk also was conducted and concluded that glyphosate was not detectable. References: 1. Michelle K McGuire, Mark A McGuire, William J Price, Bahman Shafii, Janae M Carrothers, Kimberly A Lackey, Daniel A Goldstein, Pamela K Jensen, John L Vicini, Glyphosate and aminomethylphosphonic acid are not detectable in human milk, The American Journal of Clinical Nutrition, Volume 103, Issue 5, May 2016, Pages 1285–1290, https://doi.org/10.3945/ajcn.115.126854 2. EFSA. (2018). National summary reports on pesticide residue analysis performed in 2016. EFSA Journal, 16(7), 5348. https://doi.org/org/10.2903/sp.efsa.2018.EN-1454 3. EFSA. (2019). The 2017 European Union report on pesticide residues in food. EFSA Journal, 17(6), 5743. https://doi.org/ 10.2903/j.efsa.2019.5743 4. EFSA. (2020). The 2018 European Union report on pesticide residues in food. EFSA Journal, 18(4), e06057. https://doi.org/10.2903/j.efsa.2020.6057 5. FDA. (2018). Pesticide residue monitoring program. Fiscal year 2016 pesticide report. FDA. https://www.fda.gov/Food/FoodborneIllnessContaminants/Pesticides/ucm618247.htm 6. FDA. (2019). Pesticide residue monitoring program fiscal year 2017 pesticide report. https://www.fda.gov/food/pesticides/pesticide-residue-monitoring-2017-report-and-data 7. Ehling, S., & Reddy, T. M. (2015). Analysis of glyphosate and aminomethylphosphonic acid in nutritional ingredients and milk by derivatization with fluorenylmethyloxycarbonyl chloride and liquid chromatography-mass spectrometry. Journal of Agricultural and Food Chemistry, 63(48), 10562-10568. https://doi.org/10.1021/acs.jafc.5b04453 8. NZ Ministry for Primary Industries. (2012). Dairy national chemical contaminants programme - raw milk result summary 2011/12. Retrieved 12/15/2015 from http://www.foodsafety.govt.nz/elibrary/industry/dairy-nccp-results-summary.pdf 9. Steinborn, A., Alder, L., Michalski, B., Zomer, P., Bendig, P., Martinez, S. A., Mol, H. G., Class, T. J., & Costa Pinheiro, N. (2016). Determination of glyphosate levels in breast milk samples from Germany by LC-MS/MS and GC-MS/MS. Journal of Agricultural and Food Chemistry, 64(6), 1414-1421., https://doi.org/10.1021/acs.jafc.5b05852 10. von Soosten, D., Meyer, U., Hüther, L., Dänicke, S., Lahrssen-Wiederholt, M., Schafft, H., Spolders, M., & Breves, G. (2016). Excretion pathways and ruminal disappearance of glyphosate and its degradation product aminomethylphosphonic acid in dairy cows. Journal of

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						Dairy Science, 99(7), 5318-5324. https://doi.org/10.3168/jds.2015-10585 11. Zhao, J., Pacenka, S., Wu, J., Richards, B. K., Steenhuis, T., Simpson, K., & Hay, A. G. (2018). Detection of glyphosate residues in companion animal feeds. Environmental Pollution, 243(Pt B), 1113-1118. https://doi.org/10.1016/j.envpol.2018.08.100 **The article is not reliable.**
14	Ait-Bali Y. *et al.*	CA 5.6	2020	Pre- and postnatal exposure to glyphosate-based herbicide causes behavioral and cognitive impairments in adult mice: evidence of cortical ad hippocampal dysfunction.	Archives of toxicology, (2020) Vol. 94, No. 5, pp. 1703-1723	5.4.1 case b) relevant but supplementary information: In vivo study on pre and post natal effects of Roundup on swiss mice at 2 different doses only, no OECD guideline followed, no GLP status stated, no HCD provided. Oral gavage dosing of formulated product is not relevant to real life exposure scenarios. Environmental fate and metabolism for glyphosate active ingredient versus sufractants are different, and oral co-exposures to mammals at the excessively high doses tested in this case are considered irrelevant to human health risk assessment. In addition, insufficient information is provided to determine which formulation was tested and whether it is the glyphosate EU representative formulation.
15	Al-Kawaz J. M.	CA 8.2.1	2019	Effect of acute toxicity of glyphosate in gold fish Carassius auratus.	Annals of Tropical Medicine and Public Health, (2019) Vol. 22, No. Special Issue 5, Art No. SP173	5.4.1 case b) relevant but supplementary information: This is a dose-response laboratory study on the 96-h acute toxicity to goldfish (Carassius auratus) with an endpoint of 96-h LC50 = 14.55 ppm. 4 concentrations were tested. Behavioural, morphological and histopathological changes were recorded. No analytical verifications, no control results and no information on origin / any previous exposure of fishes is available. No statistical information provided. In addition, Glyphosate was not sufficiently documented. Fish used in test were collected from fish shops and they were not correctly reported. Previous exposure to pesticides cannot be excluded. **The article was downgraded to Category B due to its non-reliability.**
16	Berry C.	CA 5.5	2020	Glyphosate and cancer: the importance of the whole picture.	Pest management science, (2020); doi: 10.1002/ps.5834; Online ahead of print.	5.4.1 case b) relevant but supplementary information: The author is providing a general picture of the carcinogenic and genotoxic profile of Glyphosate by commenting the different studies available and the different conclusions made by IARC and Regulatory authorities. There is no evidence in the animals studies to support the IARC conclusion that glyphosate is a probable human carcinogen. The article does not provide any new information.
17	Cai W. *et al.*	CA 5.6	2020	Low-dose Roundup induces developmental toxicity in bovine preimplantation embryos in vitro.	Environmental science and pollution research international, (2020) Vol. 27, No. 14, pp. 16451-16459	5.4.1 case b) relevant but supplementary information: The effects of Roundup at 3 doses was investigated on the bovine preimplantation embryo. Direct dosing of formulated product to fertilized embryos in vitro, is not relevant to real life exposure scenarios. Environmental fate, metabolism and pharmaco-kinetics for glyphosate active ingredient versus sufractants are very different, and oral co-exposures to mammals at the excessively high doses tested in this case are considered irrelevant to livestock and human health risk assessments. In addition, insufficient information is provided to determine which formulation was tested and whether it is the glyphosate EU representative formulation. No OECD guideline followed, no GLP status stated, no HCD provided and no positive control.
18	Donato F. *et al.*	CA 5.9	2020	Exposure to glyphosate and risk of non-Hodgkin lymphoma and multiple myeloma: an updated meta-analysis.	La Medicina del lavoro, (2020) Vol. 111, No. 1, pp. 63-73	5.4.1 case b) relevant but supplementary information: The publication is considered not reliable because there is nothing that has been done in this (or other) meta-analysis to address recall bias, selection bias, and failure to control for confounding factors in the NHL case-control studies. **The article was downgraded to Category B due to its non-reliability.**

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19	Eddleston M.	CA 5.9	2020	Poisoning by pesticides.	Medicine, (2020) Vol. 48, No. 3, pp. 214-217	5.4.1 case b) relevant but supplementary information: This is a review article discussing clinical features and management of pesticide overdoses. The article comments that glyphosate has much lower toxicity in acute overdose than older pesticides and discusses the use of supportive care in these overdoses. Since this describes the management of suicidal overdoses it should not impact the risk assessment / re-registration.
20	Erhunmwunse N. O. *et al.*	CA 8.2.1	2018	Acute toxicity of glyphosate-based Isopropylamine formulation to juvenile African catfish (Clarias gariepinus).	Nigerian Journal of Basic and Applied Sciences (2018) Vol. 26, No. 2, pp. 97-101	5.4.1 case b) relevant but supplementary information: This is a dose-response laboratory study on the 96-h acute toxicity to African catfish (Clarias gariepinus) juveniles with an endpoint of 96-h LC50 = 300 mg/L. However, there is a lack of analytical verifications of the substance concentration in water. No clear origin of the fishes. Unit of the endpoint is unclear (no information whether the endpoint refers to the formulation, glyphosate or its salt). Test item cannot be identified from the article. Test design stated as being based on total residual chlorine in abstract - but it does state in the methods that OECD (1992) procedure was used, which refers to the OECD 203 acute test guideline from July 1992. Concerning fish loading - if the test employed 60 L aquariums - which cannot be confirmed, the loading is too high (approx. 18 g fish/L) compared to OECD 1992 procedure for acute fish testing of approx 1 g fish/L. **The article was downgraded to Category B due to its non-reliability.**
21	Faita M. R. *et al.*	CP 10.3.1.1.1	2020	Glyphosate-based herbicides and Nosema sp. microsporidia reduce honey bee (Apis mellifera L.) survivability under laboratory conditions	Journal of Apicultural Research, (2020) Vol. 59, pp. 332-342	5.4.1 case b) relevant but supplementary information: This is an acute oral toxicity test on bees performed according to the OECD 213. Collected bees in winter and spring were orally exposed to Roundup alone, Nosema spp. spores and a combination of both. 48-h survival after exposure to Glyphosate only (calculated as 0.08 µg a.s./bee, considering an average food consumption of 30 µL/bee) was above 95% for both winter and spring collected bees. Mortality increased when exposed to the mixture with Nosema spp. spores. One single glyphosate concentration and a control was tested. The study is published in a SCI peer-reviewed journal and provides relevant toxicological information on the acute oral risk to bees but no endpoints are given. There are some lacking information: no RF test conducted, no positive control was used, performance of hive was not reported. In addition, RNA profiling not used as an endpoint is EU Annex I renewal ecotox risk assessment and the outcome of the study is not very useful for the risk assessment because the tested rate is sub-lethal.

Submission Number	**Author(s)**	**Data requirement (indicated by the corresponding CA / CP data point number)**	**Year**	**Title**	**Source**	**Justification**
22	Gonzalez D. *et al.*	CA 8.2.8	2019	Freshwater periphyton response to technical-grade and two commercial formulations of glyphosate.	Ecologia Austral, (2019) Vol. 29, No. 1, pp. 20-27	5.4.1 case b) relevant but supplementary information: The effects of a single glyphosate concentration (3 mg/L; 2, 5 and 9 days after application) provided by different means (pure glyphosate and 2 different formulations) on the structure of the microbial community in a freshwater microcosm were investigated. Pigments concentration, dry weight, ash-free dry weight, and algal density were determined. Effects on the control were provided and analytical verifications were made. An increase of Cyanobacteria and a decrease of algae abundances were registered in all treatments with the herbicide. The effect was greater for the formulations and lower with technical-grade glyphosate, suggesting that additives in the commercial formulations may enhance glyphosate effects. The test is not performed according to any OECD guidance, and no endpoints are given. The study is well written and published in an SCI journal. The article presents results for a microcosm type experiment where by 2 Litre treatment units were established with periphyton grown on substrates from a mesocosm. All substrates were pre-exposed to mesocosm water for 36 days, after which time substrates became colonised. Microbial communities were not assessed. Test water was prepared from centrifuged mesocosm waterand then 5 pre-grown substrate boards were suspecned in each of the three treatments + control. Ther test does not follow a recognised test design and there is some uncertainities with the methods used for identifying species and for example, how were dead diatyoms deteremined. Despite these substrates being naturally colonised, there is no discussion over the zooplankton community that would also have been present on the substrates including / but not limited to rotifers. The influence of other factors on the periphyton assemablages on the substrates is not discussed.
23	Guo L. *et al.*	CA 8.6.	2020	Effects of glyphosate and paraquat on root morphology and aboveground growth of Prunus persica seedlings.	Ying yong sheng tai xue bao = The journal of applied ecology, (2020) Vol. 31, No. 2, pp. 524-532	5.4.1 case b) relevant but supplementary information: The aim of the study is to examine the effects of two herbicides (glyphosate and paraquat) on vegetative growth, root structure, root-tip cell mitosis and photosynthesis in peach (Prunus persica) seedlings. The growth of both shoots and roots of the P. persica seedlings was significantly inhibited by glyphosate applied at 2.5 g/L with a plant height decrease of 31. 5% compared to control. Total root length, root surface area, root volume and the number of root tips also decreased compared to the control by 39.5%, 39.5%, 49.8% and 44.6%, respectively. The test does not follow any of the recommended OECD protocols for testing terrestrial plants at the EU level. Furthermore, the test substance is not clearly identified - it is unclear whether it is a product or a technical substance. However, the test item used cannot be related to the EU representative formulation asi it was stated that the product used was a 300 g/L formulation - but no other formulation details are presented. Exposure concentrations in the spray were not confirmed. No endpoints nor apical measurements presented that can be related to an EU level risk assessment for renewal purposes. **The article is not reliable.**

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
24	Jeon S. *et al.*	CA 5.5	2020	Glyphosate influences cell proliferation in vitro.	Frontiers in Life Science, (2020) Vol. 13, No. 1, pp. 54-65	5.4.1 case b) relevant but supplementary information: Glyphosate was tested in vitro at a range of doses to investigate its effects on cell growth and proliferation in human cells. In conclusion, Glyphosate increases the rate of cell growth in human embryonic kidney 293 (HEK293) cells. Glyphosate promotes cell proliferation by activating gene expression of cell cycle regulators in humans in vitro. Useful information but not altering risk assessment and data requirement and difficult to be used because no HCD. No positive control were used, no statistics methods were described. Furthermore, no OECD guideline followed, no GLP status stated. **The article is not reliable.**
25	Kharat T. L. *et al.*	CA 8.2.1	2016	Effect of glyphosate roundup on oxygen consumption in freshwater fish Rasbora daniconius	Ecoscan, (2016) Vol. 9, No., Spec.Iss., pp. 567-571	5.4.1 case b) relevant but supplementary information: This is a dose-response laboratory study on the 96-h acute toxicity to a local fish species (Rasbora daniconius) with an endpoint of 96-h LC50 = 5.66 mg/L. 7 concentrations were tested. Oxygen consumption was measured in a separate test when fishes are exposed to control, lethal and sub-thel concentration of the formulation in water. Behavioural and morphological observations were also made. There is a lack of analytical verifications. No statistical analysis. Glyphosate was not sufficiently documented, No information given about the control. Other relevant methodological information not provided. Wild-caught fish used in test, previous exposure to pesticides cannot be excluded. No test guideline stated. Fitness of test population unknown. Exposure test conditions, test media preparation, environmental controls - all were not defined / no water quality data reported in the results. Fish weights reported, but as test design not presented, the fish loading and influence on outcome of results cannot be determined. Uncertainity in the results based on errors in the results table i.e. 70% mortality stated to have occurred at the 4.6 mg/L rate, when the text and the report table suggest only 30% mortality. **The article was downgraded to Category B due to its non-reliability.**
26	Levine S. L. *et al.*	CA 5.8.2	2020	Review and Analysis of the Potential for Glyphosate to Interact with the Estrogen, Androgen, and Thyroid Pathways.	Pest management science, (2020), DOI 10.1002/ps.5983	5.4.1 case b) relevant but supplementary information: A systematic literature review was performed including US EPA EDSP Tier 1 battery assessment, guideline regulatory studies, ESDP including 5 in vitro and 6 in vivo assays to evaluate the EAT pathways. From the available literature, it was concluded that glyphosate does not have an endocrine disrupting potential through estrogenic, androgenic or steroidogenic activity. The review includes relevant literature which has been used for the ED assessment during the current submission process. It can therefore serve as supporting information, however as a review it does not provide new primary data or alter the risk assessment. Therefore, the review has been classified as a relevant but supplementary only (EFSA 2092 GD Point 5.4.1 category B).

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
27	Lu T. *et al.*	CA 8.2.8	2020	Understanding the influence of glyphosate on the structure and function of freshwater microbial community in a microcosm.	Environmental pollution, (2020) Vol. 260, Art. No. 114012	5.4.1 case b) relevant but supplementary information: The effects of single glyphosate concentration (2.5 mg/L, 15 days) on the structure and function of microbial communities in a freshwater microcosm were investigated. This treatment did not significantly alter the physical and chemical condition of the microcosm or the composition of the main species in the community, but the transcriptions of some cyanobacteria were significantly influenced. Under glyphosate stress, the microbial community structure did not change much, but the microbes' function varied a lot. The test is not preformed according to any OECD guidance, but the outcomes on the aquatic microbial community (algae, cyanobacteria) can be relevant for the risk assessment but no endpoints are given. There is a lack of analytical verifications of the product concentration on the artificial medium and that the samples are from a lake and therefore, previous exposure to pesticides cannot be excluded.
28	Nagai T.	CA 8.2.6	2019	Sensitivity differences among seven algal species to 12 herbicides with various modes of action.	Journal of Pesticide Science (2019) Vol. 44, No. 4, pp. 225-232	5.4.1 case b) relevant but supplementary information: For glyphosate no data presented that could impact the endpoints used in the risk assessment as they have been achieved using a method that is not recognised at the EU level. Reference to available data is considered a secondary source and therefore not relevant to EU renewal. Validity criteria not reported. ErC50 were calculated at 96h instead of at 72h. The initial green algae biomass concentration was not reported. The test substance was not clearly identified (purity unclear). Control results are missing.
29	Neto de Silva K. *et al.*	CA 5.7	2020	Glyphosate-based herbicide impairs energy metabolism and increases autophagy in C6 astroglioma cell line.	Journal of toxicology and environmental health. Part A, (2020) Vol. 83, No. 4, pp. 153-167	5.4.1 case b) relevant but supplementary information: In vitro study on the effects of micromolar concentrations of a glyphosate-based herbicide on energy metabolism and mitochondrial mass in astroglioma cell line exposed for 24 h to the herbicide at 3 concentrations below 160 µM. However, insufficient information provided to identify which formulation was tested. No positive control was used, no statistics methods were described, no OECD guideline followed, no GLP status stated, no HCD provided. In addition, astrocytes in real life are not co-exposed to the combination of glyphosate + surfactant formulants, based on their very different environmental fates and pharmaco-kinetics.
30	Parks C. G. *et al.*	CA 5.8.2	2019	Lifetime pesticide use and antinuclear antibodies in male farmers from the agricultural health study	Frontiers in Immunology (2019) Vol. 10, Art. No. 1476	5.4.1 case b) relevant but supplementary information: The development of systemic autoimmunity in response to pesticide exposure was investigated in a retrospective study farmers. Serum antinuclear autoantibodies were measured by immunofluorescence on Hep-2 cells in 668 male farmers. The effect of lifetime use of 46 pesticides (glyphosate among them) on ANA were investigated. The results for glyphosate use demonstrate no increase the risk of farmers developing systemic autoimmunity. This information is useful in a weight of evidence assessment for the measured endpoint, which, however, is not a critical endpoint identified for human health risk assessment of glyphosate.
31	Rajput R. *et al.*	CA 5.9	2019	Haemodialysis as an imperative treating modality in severe glyphosate-surfactant poisoning.	Journal, Indian Academy of Clinical Medicine, (2019) Vol. 20, No. 3-4, pp. 224-226	5.4.1 case b) relevant but supplementary information: This is a case report of a patient who developed hyperkalaemia, renal failure and pulmonary edema after a suicidal ingestion of formulated glyphosate. These clinical features are common with large ingestions. Hemodialysis is standard of care in cases such as these. This report raises no new clinical features regarding this type of overdose and should not impact risk assessment / re-registration.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
32	Ren Y. *et al.*	CA 5.9	2020	Cases report of gastrointestinal hemorrhage caused by glyphosate herbicides.	Acta Medica Mediterranea, (2020) Vol. 36, No. 3, pp. 1611-1614	5.4.1 case b) relevant but supplementary information: This article describes two patients with GI hemhorrage after formulated glyphosate ingestion. According to the history, the first patient drank excessive amounts of ethanol for a long time, which in and of itself can contribute to GI ulceration and bleeding. He also ingested triazolone. This patient's course appears to be atypical as the patient appears to have been stable on admission, was in the hospital for weeks, underwent multiple endoscopic procedures for 2 weeks after ingestion and later developed significant GI bleeding necessitating a gastrectomy. In formulated glyphosate overdoses, corrosive injury to the GI tract occurs early due to the surfactant. The second patient in this report also presented with corrosive injury to the GI tract which is not unexpected. Since this paper describes suicidal ingestions it should not impact the risk assessment / re-registration.
33	Sanudi F. *et al.*	CA 8.2.1	2018	Lethal toxicity of glyphosate herbicide on koi carp, cyprinus carpio (Linnaeus, 1758) fingerlings.	Toxicology International, (2018) Vol. 25, No. 2, pp. 139-141	5.4.1 case b) relevant but supplementary information: Bioassay experiments were conducted to determine the lethal toxicity of glyphosate herbicide on Koi carp, Cyprinus carpio fingerlings. The fishes were exposed to different concentrations of glyphosate and mortality was recorded after every 6 h for a period of 96 h. The 96 h LC50 concentration for glyphosate on Koi carp fingerlings was found to be 33.2 mg/L. There is no test item information, nor biological observation data presented to corroborate the findings, in addition no chemical analysis and therefore exposure cannot be confirmed. **The article was downgraded to Category B due to its non-reliability.**
34	Selvarani A. J. *et al.*	CA 8.2.1	2019	Acute toxicity of glyphosate herbicide on Nile tilapia (Oreochromis niloticus)	International Journal of Current Microbiology and Applied Sciences, (2019) Vol. 8, No. 10, pp. 61-68	5.4.1 case b) relevant but supplementary information: This test was performed in a static renewal regime with Nile tilapia (Oreochromis niloticus) exposed to 5 different concentrations of glyphosate (15.33, 30.67, 61.34, 122.68 and 245.36 mg/L) for 96 hours. Mortality was recorded but also the gill, liver and kidney tissues were dissected out. Lack of analytical verifications of the substance concentration in water but exposure medium was changed every 24 h to maintain the desired concentrations. The test item is not identified. There is no chemical analysis. Water quality measurements have / appear to have only been done at the test start. A table is presented, but whether this is starting or duration derived values is unknown. Fish loading during the 96 hr test is excessive. 10 x 100 g fish in 50 litres = 20 g fish / litre. US EPA requires 0.8 g fish/L; OECD requires 1.0 g/L. This study would be considered invalid in the EU and the US for these reasons. **The article was downgraded to Category B due to its non-reliability.**
35	Solis-Gonzalez G. *et al.*	CA 8.2.4.2; CA 8.2.6.2	2019	Acute toxicity of N-(phosphonomethyl) glycine herbicide on planktonic microorganisms Artemia franciscana and Microcystis aeruginosa.	TIP Revista Especializada en Ciencias Quimico-Biologicas, (2019) Vol. 22, pp. 1-8	5.4.1 case b) relevant but supplementary information: The aim of this research was to evaluate the median lethal concentration at 24h in Artemia franciscana, as well as the median population inhibitory concentration and the coefficient of form in the cyanobacterium Microcystis aeruginosa in aquatic ecosystems. The calculated endpoint for A. franciscana was 24-h LC50 = 0.31 mg/L and for M. aeruginosa was 72-h ErC50 = 53.95 mg/L. Lack of analytical verifications during the test. Tested concentrations and dissolved oxygen (for invertebrate species) was not reported. For the additional aquatic invertebrate species, mortality was calculated at 24h (instead of at 48h). As raw data are not provided, it is not possible to check the validity criteria of the tests. The endpoints and the performance of the controls cannot be validated. **The article was downgraded to Category B due to its non-reliability.**

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
36	Soukup S. T. *et al.*	CA 5.9	2020	Glyphosate and AMPA levels in human urine samples and their correlation with food consumption: results of the cross-sectional KarMeN study in Germany.	Archives of toxicology, (2020) Vol. 94, No. 5, pp. 1575-1584	5.4.1 case b) relevant but supplementary information: The authors calculated the intake of glyphosate and AMPA based on urinary concentrations and checked this value against the EU acceptable daily intake (ADI) value for glyphosate. The exposure to glyphosate and AMPA was found to be very low. Quantifiable levels of glyphosate and/or AMPA was detected in 8.3% (25 out or 301) of the participants with the highest reported value (0.63 µg/kg BW) being 0.13% of the ADI. 24-hr urine samples were collected from 301 adults for analysis of glyphosate. The study subjects were recruited to be healthy and not taking medications. The glyphosate exposures as a percent of the ADI were calculated. However, unlike previous studies, this calculation was not derived using assumptions for body weight or volume of urine. Rather, ADIs were calculated for each study subject using their own body weight and 24-hr urine excretion. Samples were analyzed using an LC-MS/MS that was modified by the procedure of Jensen *et al.* (1), and 66.5% had neither no detectable glyphosate nor AMPA in urine. Glyphosate and/or AMPA was quantifiable detected in 8.3% of participants with a maximum glyphosate exposure of 0.63 µg/kg BW, which was 0.13% of the ADI. The maximum intake of AMPA + glyphosate corresponded to 0.16% of the ADI. This study also used 24-hr dietary recalls and did rank-order correlations to estimate food sources of glyphosate and AMPA. This was done based solely of the amount of food and not glyphosate content of the food. Nevertheless, they found that consumption of pulses and mushrooms were correlated with glyphosate and AMPA in urine, respectively. Absorbed glyphosate is not metabolized in the body suggesting that ingestion of AMPA per se, not glyphosate, was responsible for urinary AMPA. As a result of their study, the authors concluded that “based on the current risk assessment of glyphosate by EFSA, such exposure levels are not expected to pose any risk to human health. The detected associations with consuming certain foods are in line with reports on glyphosate and AMPA residues in food.” References 1. Jensen, P. K., Wujcik, C. E., McGuire, M. K., and McGuire, M. A. (2016) Validation of reliable and selective methods for direct determination of glyphosate and aminomethylphosphonic acid in milk and urine using LC-MS/MS. Journal of Environmental Science and Health. Part. B, Pesticides, Food Contaminants, and Agricultural Wastes 51, 254-259

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
37	Tang Q. *et al.*	CA 5.3	2020	Glyphosate exposure induces inflammatory responses in the small intestine and alters gut microbial composition in rats.	Environmental pollution, (2020) Vol. 261, Art. No. 114129	5.4.1 case b) relevant but supplementary information: The rats were gavaged with 0, 5, 50, and 500 mg/kg of body weight glyphosate for 35 continuous days. The different segments of the small intestine were sampled to measure indicators of oxidative stress, ion concentrations and inflammatory responses, and fresh feces were collected for microbiota analysis. The investigation of potential effects on the gut microbiome of ruminants is not a data requirement for the approval of pesticides and suitable test protocols to assess these effects are not specified in the form of official guidance documents. No GLP status stated, no HCD provided and no purity of glyphosate stated. Fundamental parameters to understand animal health and toxicology endpoints are not reported. Therefore the context of the study results can not be interpreted with any degree of certainity. **The article is not reliable.**
38	Uengchuen K. *et al.*	CA 5.9	2020	Health risk assessment on the glyphosate exposure of knapsack sprayers.	Indian Journal of Public Health Research and Development, (2020) Vol. 11, No. 3, pp. 2088-2093	5.4.1 case b) relevant but supplementary information: This article describes an assessment tool designed by the researchers to evaluate level of exposure based on PPE use, self-reported symptoms 6 months after use and frequency of use. They found that most farmers used PPE and had minimal symptoms such as burning eyes which may be due to the surfactant in formulations. There were no severe symptoms and no description of long-term outcomes. This descriptive article describes self-reported non-specific symptoms (nausea, headache, rash, burning eyes) in glyphosate users and should not affect the risk assesment / re-registration.
39	Yang F. *et al.*	CA 5.9	2020	Acute obstructive fibrinous laryngotracheobronchitis induced by severe glyphosate surfactant intoxication: A case report.	World journal of emergency medicine, (2020) Vol. 11, No. 2, pp. 125-126	5.4.1 case b) relevant but supplementary information: This is a case report describing a patient who developed fibrinous tracheobronchitis after a suicide attempt with formulated glyphosate. Since the surfactant can cause corrosive injury and the patient had evidence of aspiration, this would be a possible side effect. Since this reflects a suicidal ingestion, it should not impact the risk assessment / re-registration.
40	Ye J. *et al.*	CA 8.2.6	2019	The Growth, Apoptosis and Oxidative Stress in Microcystis viridis Exposed to Glyphosate	Bulletin of environmental contamination and toxicology (2019) Vol. 103, No. 4, pp. 585-589	5.4.1 case b) relevant but supplementary information: Provides information on the effects of glyphosate on the growth of Microcystis viridis at 4 different concentrations every 24 h for 10 days but no endpoints are given. The algal growth inhibition test was conducted according to the OECD guideline 201-Freshwater Alga and Cyanobacteria (2011). However, as no raw data and only results in figures were presented, it is not possible to check its validity criteria. No reference substance has been tested. Analytical verifications were performed but it is not clear in the study whether they are only made at the test start or also during the study. Analytically, over a 3 day period, glyphosate is very stable under illuminated conditions. Under 240 hours exposure, it is highly unlikely that the authors could have achieved such high recoveries, hence the thought would be that the measured values presented were initial measured concentrations. The duration of the study is longer than recommended (10 days instead of 3), but growth rate is recorded after 72 h. There is not sufficient information presented to corroborate the findings.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
41	Zhang F. *et al.*	CA 5.9	2020	Concentration Distribution and Analysis of Urinary Glyphosate and Its Metabolites in Occupationally Exposed Workers in Eastern China.	International journal of environmental research and public health, (2020) Vol. 17, No. 8, Art. No. 2943	5.4.1 case b) relevant but supplementary information: This study followed workers who were occupationally exposed to glyphosate in a manufacturing facility. They measured ambient air concentrations and then measured urinary concentrations of glyphosate and AMPA and found that the detection rates of glyphosate (>0.020mg/L) and AMPA (>0.010mg/L) were 86.6% (116/134) and 81.3% (109/134), respectively. The median values were 0.292 mg/L and 0.068 mg/L for urinary glyphosate and AMPA. There was variability in exposure based on where the worker was physically in the plant. This study was looking at biomarkers for exposure and makes no health claims regarding thise exposures.
42	Zhang Y. *et al.*	CA 8.2.6.2	2016	Inhibitory activity of 26 herbicides against the growth of Scenedesmus obliquus	Anhui Nongye Kexue, (2016) Vol. 44, No. 23, pp. 132-133	5.4.1 case b) relevant but supplementary information: The aim of this research was to determine the inhibitory activities of 26 herbicides against the growth of the microalgae Scenedesmus obliquus using an absorption spectrophotometry method. Among the 26 herbicides, glyphosate was categorized as low toxic (72 h EyC50 = 73.9 mg/L) and glyphosate-isopropylammonium (72 h EyC50 = 2.21 mg/L) as moderately toxic. Methodology of the test is poorly described and then only final conclusions are reported. The article was published in non-peer reviewed journal. Lack of analytical verifications during the test. pH not reported. Test substance is not clearly identified and tested rates are not reported. The response variable was given as yield, which may be needed to fulfil specific regulatory requirements in some EU countries. However, the data basis of the endpoint is unclear as it was also stated that inhibition concentration based on biomass was calculated. The inhibition rate was calculated using the absorption of the tested solutions and the conversion factor (cell number vs. absortion) is not known. The strain/ origin of the tested organisms is not suficiently reported. As raw data are not provided, it is not possible to check the validity criteria of the tests. The endpoints and the performance of the controls cannot be validated. **The article was downgraded to Category B due to its non-reliability.**

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
43	Zoller O. *et al.*	CA 5.1	2020	Urine glyphosate level as a quantitative biomarker of oral exposure.	International journal of hygiene and environmental health, (2020) Vol. 228, Art. No.113526	5.4.1 case b) relevant but supplementary information: This was a study with human volunteers. The trial was designed to ensure comparable exposure levels to glyphosate among participants who consumed diets with low content of glyphosate residue during the 4-day trial, except for the single meal with targeted amount of glyphosate and AMPA corresponding to an intake of 196.8 µg of glyphosate and 1.67 µg of AMPA. Only urine was collected and analysed for glyphosate and AMPA. Blood and faeces were not collected and/or analysed. This goal of the study was to estimate oral glyphosate intake using urinary biomonitoring data. However, the authors recognised that the determination of blood concentrations is necessary to improve human bioavailability data. Comparison of urinary data in humans in this study with those measured in the rat studies suggest that the systemic availability is much lower in humans than in rats and could be about 20-fold lower. However, in the absence of a mass balance, and a very low recovery of glyphosate and AMPA, the data should be considered unreliable. Given the knowledge that orally dosed glyphosate is mostly excreted via the faeces, an appropriate study design to address mass balance could easily have been implemented to make this a robust and informative investigation. Low recovery rates of glyphosate and AMPA suggest a very large capacity for errors. The study design is inadequate to confirm reliability of the findings. The lack of mass balance of analytes, despite common knowledge that orally dosed glyphosate is mostly excreted in faeces, is disappointing, given the ease with which a mass balance could have been assessed. **The article was downgraded to Category B due to its non-reliability.**

Table 36: Articles of unclear relevance (category C) after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Table 37: Articles of unclear relevance (category C) after detailed assessment: sorted by author(s)

Submission Number	**Author(s)**	**Data requirement (indicated by the corresponding CA / CP data point No.)**	**Year**	**Title**	**Source**	**Justification**
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Table 38: Articles excluded after detailed assessment (i.e. not relevant): sorted by technical section (and by author)

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
44	Ecotoxicology	Almeida P. R. *et al.*	2019	Acute toxicity (CL50) and behavioral and morphological effects of a commercial formulation with glyphosate active ingredient in tadpoles of Physalaemus cuvieri (Anura, Leptodactylidae) and Rhinella icterica (Anura, Bufonidae).	Engenharia Sanitaria e Ambiental (2019) Vol. 24, No. 6, pp. 1115-1125	The publication is not relevant as in the conclusion, the authors indicated that the product used contains POEA. POEA is not permitted for use in formulated herbicidal products in the EU. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the risk assessment for EU renewal. In addition, there is a lack of analytical verifications of the substance concentration in water. Unit of the endpoint is unclear and no information provided whether the endpoint refers to the formulation, glyphosate or its salt.
45	Ecotoxicology	Carpenter D. J. *et al.*	2020	Effects of Herbicides on Flowering.	Environmental toxicology and chemistry, (2020) Vol. 39, No. 6, pp. 1244-1256	Although Glyfos and Glyphogan are both glyphosate 360 SL formulations, they do contain different surfactant systems. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the risk assessment for EU renewal. The surfactant system used in glyfos and glyphogan are respectively - tallow ethoxylate based or oxyethoxylate based, whereas the surfactant used in MON 52276 is ammonium based.
46	Ecotoxicology	Fathi M. A. *et al.*	2020	Disruption of cytochrome P450 enzymes in the liver and small intestine in chicken embryos in ovo exposed to glyphosate.	Environmental science and pollution research international, (2020) Vol. 27, No. 14, pp. 16865-16875	The publication investigates the effects on antioxidant enzyme activity, histomorphology on the liver and small intestine. Enzyme, cellular and molecular level endpoints are not relevant to EU level ecotoxicology risk assessment.
47	Ecotoxicology	Kalai K. *et al.*	2019	Effect of induced chronic glyphosate toxicity in liver and kidneys of kuroiler birds.	Indian Journal of Veterinary Pathology (2019) Vol. 43, No. 3, pp. 211-216	The publication investigates biochemical, histopathological and cellular ultrastructural parameters of blood and liver tissues and only findings on cellular/molecular level are reported. Enzyme, cellular and molecular level endpoints are not relevant to EU level ecotoxicology risk assessment.
48	Ecotoxicology	Meshkini S. *et al.*	2019	acute and chronic effect of Roundup herbicide on histopathology and enzymatic antioxidant system of Oncorhynchus mykiss	International journal of environmental science and technology (2019) Vol. 16, No. 11, pp. 6847-6856	The principal reason for this paper not being relevant is that EPA registration No. 524-529 is a concentrate formulation (50.2%) which contains POEA surfactant. POEA is not permitted for use in formulated herbicidal products in the EU. The article is therefore not relevant to an EU regulatory risk assessment / glyphosate EU renewal.
49	Ecotoxicology	Mestre A. P. *et al.*	2020	Effects of glyphosate, cypermethrin, and chlorpyrifos on hematological parameters of the tegu lizard (Salvator merianae) in different embryo stages.	Chemosphere, (2020) Vol. 252, Art. No. 126433	The publication investigates haematological parameters on reptiles' embryos and only findings at the cellular/molecular level are reported. Enzyme, cellular and molecular level endpoints are not relevant to EU level ecotoxicology risk assessment.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
50	Ecotoxicology	Mottier A. *et al.*	2020	In vitro effects of glyphosate-based herbicides and related adjuvants on primary culture of hemocytes from Haliotis tuberculata.	Fish & shellfish immunology, (2020) Vol. 100, pp. 1-8	The publication investigates in vitro effects on hemocytes and only findings on cellular/molecular level are reported. Enzyme, cellular and molecular level endpoints are not relevant to EU level ecotoxicology risk assessment.
51	Ecotoxicology	Odetti L. M. *et al.*	2020	Genotoxicity and oxidative stress in Caiman latirostris hatchlings exposed to pesticide formulations and their mixtures during incubation period.	Ecotoxicology and environmental safety, (2020) Vol. 193, Art. No. 110312	In vivo study on the effects of Glyphosate-based herbicides on eggs of Caiman latirostris. The formulation tested (GLY Roundup® Full II (66.2%), water-soluble herbicide (12000 mg/L), containing potassium salt) is not the EU representative formulation for the glyphosate EU renewal and therefore not relevant for the EU risk assessment.
52	Ecotoxicology	Owagboriaye F. *et al.*	2020	Biochemical response and Vermiremediation assessment of three earthworm species (Alma millsoni, Eudrilus eugeniae and Libyodrilus violaceous) in soil contaminated with a Glyphosate-based herbicide	Ecological indicators (2020) Vol. 108, Art. No. 105678	This study aimed to evaluate the biochemical response and vermiremediation potential of three indigenous earthworm species in glyphosate treated soils. Test design and achieved results are not relateable to an EU level regulatory risk assessment for Annex I renewal.
53	Ecotoxicology	Pontes J. P. *et al.*	2020	A glyphosate-based herbicide in a free-choice test on parasitism, emergence, and female-biased sex ratio of 10 Trichogrammatidae.	Journal of Plant Diseases and Protection, (2020) Vol. 127, No. 1, pp. 73-79	Roundup Original DI® (a mixture of IPA and diammounium salts) is not the EU representative formulation, therefore the article is not relevant for the glyphosate EU renewal.
54	Ecotoxicology	Ruuskanen S. *et al.*	2020	Effects of parental exposure to glyphosate-based herbicides on embryonic development and oxidative status: a long-term experiment in a bird model.	Scientific reports, (2020) Vol. 10, No. 1, pp. 6349	Roundup Flex is a potassium salt based formulation and has a different surfactant system compared to the EU representative formulation. Therefore, this publication is not relevant for the EU glyphosate renewal.
55	Ecotoxicology	Shitha C. *et al.*	2017	Impact of glyphosate and chlorpyriphos on chemical and biological properties of a lateritic soil	Pesticide Research Journal (2017) Vol. 29, pp. 68-74	Roundup SL is commercialized in India and it is not the EU representative formulation thus this article is not relevant for the EU glyphosate renewal. In addition, the study design, the test system and the species tested are not relevant for the European regulatory purposes. The tested soil (even for lab tests) is a local one in India. The tested species (Perionyx excavatus in the case of earthworms) are also native. In addition, the field experiments are not dealing with EU representative conditions. No experiment was performed according to any of the EU recommended testing guidances/designs. No useful endpoint can be derived.
56	Ecotoxicology	Vazquez D. E. *et al.*	2020	Chronic exposure to glyphosate induces transcriptional changes in honey bee larva: A toxicogenomic study.	Environmental pollution, (2020) Vol. 261, Art. No. 114148	The publication investigates the effects of chronic exposure of a single concentration of pure glyphosate on honey bee larvae regarding their gene expression profile using a transcriptomic approach. However, the study design and the test system are not relevant for the European regulatory purposes. The experiment was not performed according to any of the EU recommended testing guidances/designs. No usefull endpoint can be derived. No positive control was tested.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
57	Ecotoxicology	Villar S. *et al.*	2019	Measurement of genetic damage in Apis mellifera caused by agrochemicals using comet assay.	Current Topics in Toxicology, (2019) Vol. 15, pp. 133-139	The publication investigates the effects of acute exposure of a glyphosate formulation on adult honey bee DNA. Only findings at the cellular/molecular level are reported. Enzyme, cellular and molecular level endpoints are not relevant to EU level ecotoxicology risk assessment.The experiment was not performed according to any of the EU recommended testing guidances/designs.
58	Toxicology and metabolism	Alarcon R. *et al.*	2020	Neonatal exposure to a glyphosate-based herbicide alters the uterine differentiation of prepubertal ewe lambs.	Environmental pollution, (2020) Vol. 265, No. Pt B, Art. No. 114874	Roundup FULL II® (Argos SRL, Santa Fe, Argentina), a liquid water-soluble formulation containing 54 g of glyphosate in 100 mL of commercial formulation is not the EU representative formulation for the EU glyphosate renewal and therefore not relevant to the EU glyphosate renewal. In addition, direct injection into the neck of pregnant ewes with formulated product containing surfactant is not relevant to real life exposure scenarios. Environmental fate, metabolism and pharmaco-kinetics for glyphosate active ingredient versus sufractants are very different. Given the direct systemic exposure, these data are considered irrelevant to livestock and human health risk assessments.
59	Toxicology and metabolism	Barbasz A. *et al.*	2020	Toxicity of pesticides toward human immune cells U-937 and HL-60.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2020) pp. 1-7; Doi: 10.1080/03601234.2020.1777059	Human histiocytic lymphoma cell line (U-937) and human promyelocytic cell line (HL-60) were exposed to glyphosate at a concentrations from 1.3 mM to 21.3 mM. Although the data are accurate, the doses selected are not physiologically relevant to human health risk assessment. Effects are noted well in excess of physiologically relevant doses and therefore, are not applicable to the risk assessment.
60	Toxicology and metabolism	Calvo-Trujillo M. *et al.*	2019	Exposure to pesticides as a risk factor for Parkinson's disease: A case-control study in San Juan Nepomuceno Town (Bolivar).	Revista de Toxicologia, (2019) Vol. 36, No. 2, pp. 142-147	This publication describes an association between pesticide exposure and Parkinson's disease. The only context in which glyphosate is mentioned is to say that it is a widely used herbicide. There is no claim that glyphosate exposure is associated with PD and therefore this article is not relevant for the glyphosate EU renewal.
61	Toxicology and metabolism	Coppola L. *et al.*	2020	Integrated approach to evaluate the association between exposure to pesticides and idiopathic premature thelarche in girls: The PEACH project.	International Journal of Molecular Sciences, (2020) Vol. 21, No. 9, Art. No. 3282	No results are provided in the article, only a section with expected results is included. The article does not provide any new information that can be used in the risk assessment.
62	Toxicology and metabolism	de Castilhos Ghisi N. *et al.*	2020	Glyphosate and its toxicology: A scientometric review.	The Science of the total environment, (2020) Vol. 733, Art. No 139359	This scientometric review does not focus on toxicological endpoints following a glyphosate exposure of any kind. No relevant information or conclusion on the toxicity of glyphosate for the risk assessment can be drawn.
63	Toxicology and metabolism	Devault D. A. *et al.*	2020	Wastewater-based epidemiology approach to assess population exposure to pesticides: a review of a pesticide pharmacokinetic dataset	Environmental science and pollution research international (2020) Vol. 27, No. 5, pp. 4695-4702	This publication is a literature review and does not contain any toxicological endpoints following the exposure to glyphosate. It rather aims to identify from literature if it is possible to use waste-water based epidemiology to assess human exposure to different pesticides. The article cannot contribute to the risk assessment of glyphosate.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
64	Toxicology and metabolism	Djaber N. *et al.*	2020	Roundup-induced biochemical and histopathological changes in the liver and kidney of rats: the ameliorative effects of Linum usitatissimum oil.	Acta Biochimica Polonica, (2020) Vol. 67, No. 1, pp. 53-64	Roundup TURBO (450 g/L) is not the EU representative formulation and therefore not relevant to the EU glyphosate renewal. The Roundup dosing rationale in the study appeared to be to intentionally elicit toxic effects and endorse the administration of Linum usitatissimum oil (LuO) to counter toxicty to liver/kidney tissue (perhaps preventive?). With this approach the dosing regimine is a major flaw in the study design as only one dose level was selected and it is unclear what effects may have been seen, if any, at more relevant exposure levels.
65	Toxicology and metabolism	Gallegos C. E. *et al.*	2020	Intranasal glyphosate-based herbicide administration alters the redox balance and the cholinergic system in the mouse brain.	Neurotoxicology, (2020) Vol. 77, pp. 205-215	Glifloglex®, marketed in Argentina, is not the EU representative formulation and therefore not relevant to the EU glyphosate renewal.
66	Toxicology and metabolism	Gomez A. L. *et al.*	2020	Exposure to a Glyphosate-based Herbicide Alters the Expression of Key Regulators of Mammary Gland Development on Pre-pubertal Male Rats.	Toxicology, (2020) Vol. 439, Art No. 152477	In vivo study on pre and post natal effects of Glyphosate-based herbicide administered to Wistar female rat at 3.5 and 350 mg/kg/day (8-10 females rat/group). Glyphosate-based herbicide (Glyphosate 66.2% - potassium salt, acid equivalent 54%) was tested, which is not the EU representative formulation and thus article is not relevant for the EU glyphosate renewal.
67	Toxicology and metabolism	Hamdaoui L. *et al.*	2020	Sub-chronic exposure to Kalach 360 SL, Glyphosate-based Herbicide, induced bone rarefaction in female Wistar rats.	Toxicology, (2020) Vol. 436, Art. No. 152412	In vivo study on effects of Kalach 360 SL on ED parameters on wistar female rat at 2 different doses. Kalach 360 SL is not the EU representative formulation and thus article is not relevant for the EU glyphosate renewal. Kalach 360 SL contains POEA (polyethoxylated tallow amine) which is not permitted for use in formulated herbicidal products in the EU.
68	Toxicology and metabolism	Kass L. *et al.*	2020	Relationship between agrochemical compounds and mammary gland development and breast cancer.	Molecular and cellular endocrinology, (2020) Vol. 508, Art. No. 110789	This very limited literature review focuses on the endocrine disrupting potential of different agrochemicals with glyphosate among them. Some relevant in vitro, in vivo and epidemiological studies assessing the effects of glyphosate on several factors related to endocrine function, are summarised. The cited monitoring studies highlight that glyphosate-based herbicides were detected in human samples (milk, urine, maternal blood), but contrary scientific papers are not cited. In vitro studies performed with relevant cell lines are presented to be affected by glyphosate. Further, in vivo studies investigating developmental parameters describe effects allegedly induced by glyphosate and are suggested to result from altered endocrine function. The literature review does not provide any new data. It only summarises existing data and states that it is not possible to distinguish if the effects are caused by the active substance glyphosate or additives in the formulation such as surfactants. Due to this statement and no new data the literature review has been classified as not relevant.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
69	Toxicology and metabolism	McCully K. S.	2020	Environmental Pollution, Oxidative Stress and Thioretinaco Ozonide: Effects of Glyphosate, Fluoride and Electromagnetic Fields on Mitochondrial Dysfunction in Carcinogenesis, Atherogenesis and Aging.	Annals of clinical and laboratory science, (2020) Vol. 50, No. 3, pp. 408-411	No experimental set up is used to investigate glyphosate toxicity. Therefore, it cannot provide new information. A very limited toxicological evaluation of glyphosate fluoride and electromagnetic fields is described based on selected literature, very specific endpoints and not specifiying the compound (glyphosate as active ingredient or formulation) which was used in the studies that are cited. This review is considered not relevant.
70	Toxicology and metabolism	Mendler A. *et al.*	2020	Mucosal-associated invariant T-Cell (MAIT) activation is altered by chlorpyrifos- and glyphosate-treated commensal gut bacteria.	Journal of Immunotoxicology, (2020) Vol. 17, No. 1, pp. 10-20	Gut microbiome (Escherichiacoli, Bifidobacterium adolescentis and Lactobacillus reuteri) were exposed to different concentrations of a glyphosate formulation. Peripheral blood mononuclear cells (PBMCs) obtained from human volunteers were then stimulated with either pesticide-treated or non-treated bacteria (B. adolescentis or L. reuteri). Untreated E. coli were added later. MAIT cells were identified with flow cytometry and riboflavin and folate contents were measured using LC-MS/MS and electroluminescence immunoassay, respectively. A proteomic analysis was performed in E. coli. In conclusion, glyphosate might alter bacterial metabolism potentially leading altered inflammatory immune responses. A formulation of glyphosate is tested in vitro. The article is excluded as in vitro testing of glyphosate formulations produce surfactant induced cytotoxicity that is not representative for glyphosate or relevant of human in vivo exposure scenarios. Further, PBMCs instead of MAIT cells derived from gut were used.
71	Toxicology and metabolism	Namratha M. L. *et al.*	2019	Effect of glyphosate (GLP) induced toxicity on body weights and gross pathology: ameliorative effect of ascorbic acid (AA) in wistar rats	International Journal of Current Microbiology and Applied Sciences, (2019) Vol. 8, No. 10, pp. 1486-1493	Roundup® (41%) procured in India is not the EU representative formulation (the composition and surfactant system differs from the EU representative formulation), therefore the article is not relevant for the EU glyphosate renewal.
72	Toxicology and metabolism	Ongono J. S. *et al.*	2020	Pesticides used in Europe and autism spectrum disorder risk: can novel exposure hypotheses be formulated beyond organophosphates, organochlorines, pyrethroids and carbamates? - A systematic review.	Environmental research, (2020) Vol. 187, pp. 109646	Review on potential role of neuro- and thyrotoxic pesticides authorized in Europe other than those widely studied (i.e. OCs, OPs, pyrethroids and carbamates) in the risk of ASD in children or ASD behavioral phenotypes in rodents. This publication is very theoretical and it relies on the interpretation of anxiety like behaviour seen in mice (but not in rats) and the extrapolation of this to humans. Also the paper only identifies a “potential link”, there is no actual exposure driven observations in humans. Therefore the publication is considered as not relevant.
73	Toxicology and metabolism	Onyekachi U. C. *et al.*	2019	Chemoprotective potentials of selected dietary supplements in glyphosate-based herbicide-induced nephrotoxicity and dyslipidemia in albino wistar rats	Asian Journal of Biological Sciences, (2019) Vol. 12, No. 2, pp. 320-327	Intraperitoneal injection with formulated product containing surfactant is not relevant to real life exposure scenarios. Environmental fate, metabolism and pharmaco-kinetics for glyphosate active ingredient versus sufractants are very different. Given the direct systemic exposure, these data are considered irrelevant to livestock and human health risk assessments.

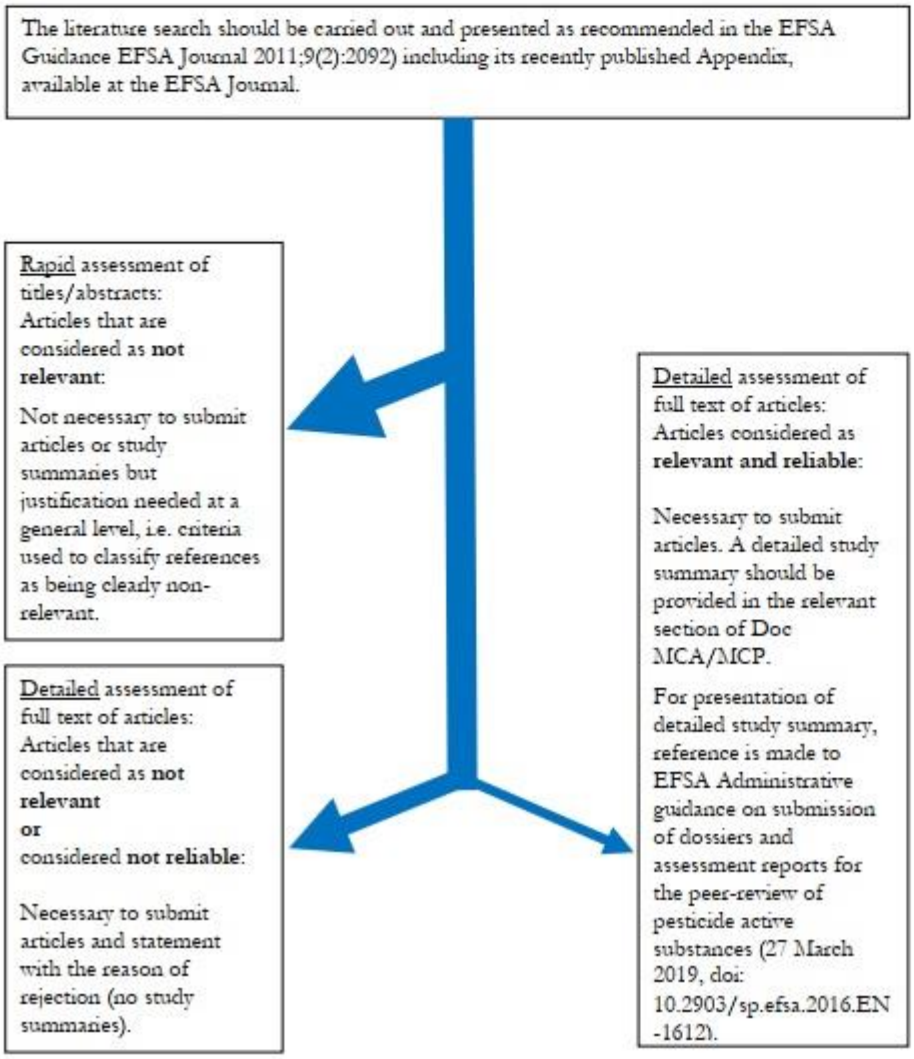
Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
74	Toxicology and metabolism	Pu Y. *et al.*	2020	Glyphosate exposure exacerbates the dopaminergic neurotoxicity in the mouse brain after repeated administration of MPTP.	Neuroscience letters, (2020) Vol. 730, Art. No. 135032	This in vivo study investigated the potential of Roundup Maxload to cause parkinson's disease. Roundup Maxload (48% w/v, potassium salt), 52% other ingredients such as water and surfactants), is not the EU representative formulation, therefore the article is not relevant for the the EU glyphosate renewal.
75	Toxicology and metabolism	Pu Y. *et al.*	2020	Maternal glyphosate exposure causes autism-like behaviors in offspring through increased expression of soluble epoxide hydrolase.	Proceedings of the National Academy of Sciences of the United States of America, (2020) Vol. 117, No. 21, pp. 11753-11759	In this in vivo study one concentration of Roundup Maxload was used to dose pregnant mice in drinking water to investigate the risk for autism spectrum disorder in their offspring. Roundup Maxload (48% w/v, potassium salt, 52% other ingredients such as water and surfactants), is not the EU representative formulation, therefore the article is not relevant for the EU glyphosate renewal.
76	Toxicology and metabolism	Schnabel K. *et al.*	2020	Functionality and DNA-damage properties of blood cells in lactating cows exposed to glyphosate contaminated feed at different feed energy levels.	Archives of animal nutrition, (2020) Vol. 74, No. 2, pp. 87-106	The formulation tested is not the EU representative formulation MON 52276. Roundup Record (007525-60/MOT), Monsanto, Agrar Deutschland GmbH (Düsseldorf, Germany) was used as water-soluble granulate, containing 720 g GL/kg as an active ingredient. Therefore te article is not relevant for the EU glyphosate renewal.
77	Toxicology and metabolism	Turkmen R. *et al.*	2020	Determination of acute oral toxicity of glyphosate isopropylamine salt in rats.	Environmental science and pollution research international, (2020) Vol. 27, No. 16, pp. 19298-19303	The glyphosate formulation Knockdown 48 SL, which is marketed by Safa Tarım Inc. in Turkey, is not the EU representative formulation therefore the publication is not relevant for the EU glyphosate renewal.
78	Toxicology and metabolism	Zhao J. B. *et al.*	2020	Clinical analysis of 15 cases of acute glufosinate poisoning.	Zhonghua lao dong wei sheng zhi ye bing za zhi = Zhonghua laodong weisheng zhiyebing zazhi = Chinese journal of industrial hygiene and occupational diseases, (2020) Vol. 38, No. 5, pp. 372-374	This publication discusses acute poisoning cases of glufosinate-ammonium. Glyphosate was mentioned only once in the following context: Glufosinate is a broadspectrum contact herbicide. Its toxicity is between glyphosate and paraquat.

Appendix 1: AGG ADVICE on how to present the literature search in the dossier

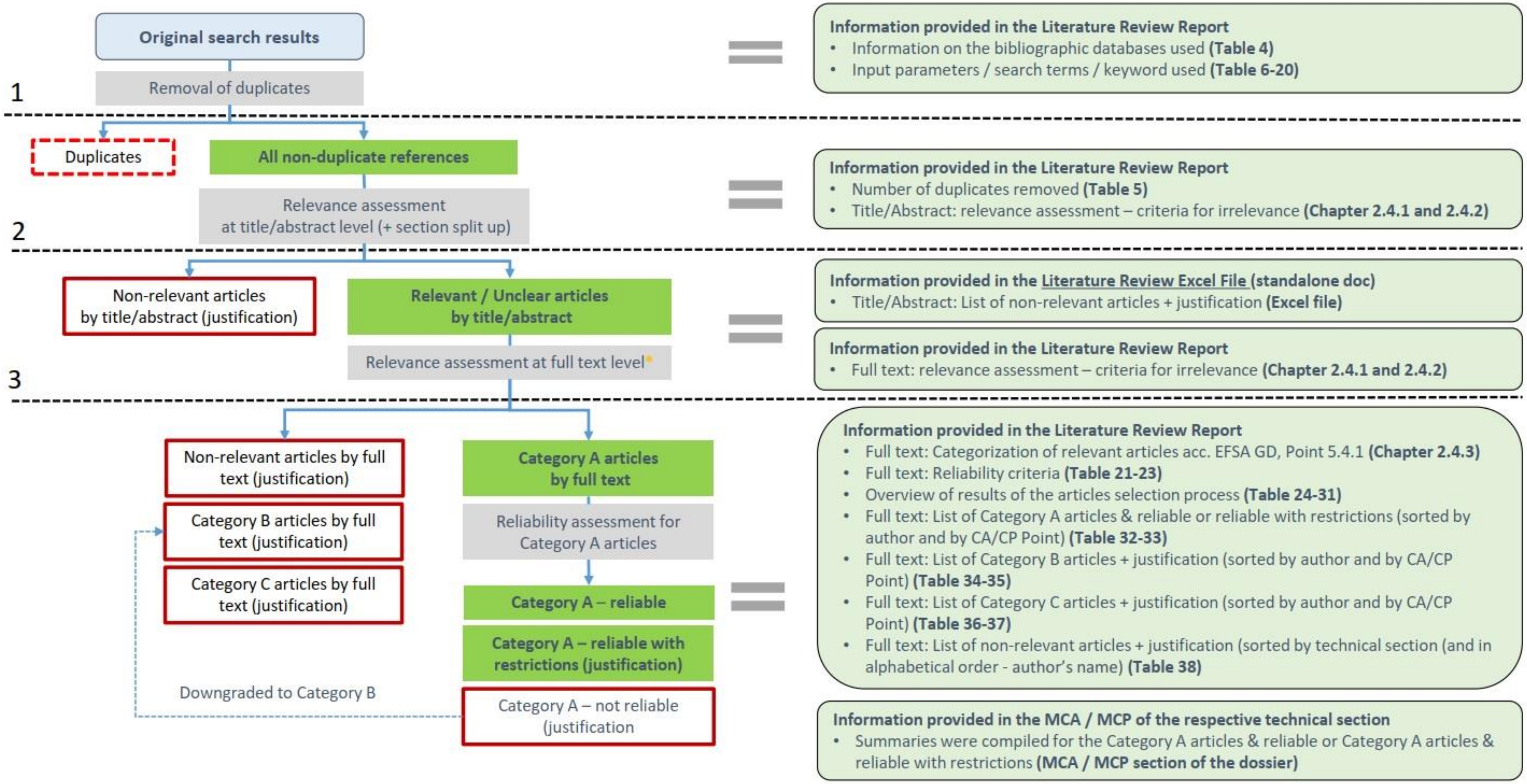
ASSESSMENT GROUP ON GLYPHOSATE (AGG)

October 2019

ADVICE TO GTF2:
HOW TO PRESENT THE LITERATURE SEARCH
IN THE DOSSIER TO BE SUBMITTED JUNE 2020



Appendix 2: The process of articles selection



* All articles (and their translations) evaluated at full-text level (detailed assessment) are submitted to the AGG.

Appendix 3: ORIGINAL SEARCH QUERY - January 2020 – June 2020

Preparing the search queries on STN:

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    FILE 'STNGUIDE' ENTERED AT 18:54:53 ON 01 JUL 2020
CHARGED TO COST=113898
L1          QUE SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
            GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
            5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
            69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
            OR 1066-51-9
            SAVE TEMP L1 GLY1/Q
L2          QUE SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
            ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
            AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
             PHOSPHONIC ACID OR 57637-97-5
            SAVE TEMP L2 GLY2/Q
L3          QUE SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
            IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
            C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
            YDROXYMETHYL OR PHOSPHONOMETHANOL
L4          QUE SPE=ON  ABB=ON  PLU=ON  HYDROXYMETHYLPHOSPHONATE OR
            HYDROXYMETHYLPHOSPHONIC ACID
L5          QUE SPE=ON  ABB=ON  PLU=ON  L3 OR L4
            SAVE TEMP L5 GLY3/Q
L6          QUE SPE=ON  ABB=ON  PLU=ON  35404-71-8 OR METHYLAMINO METHYL
            PHOSPHONIC ACID OR METHYLAMINOMETHYL PHOSPHONIC ACID OR
            METHYLAMINOMETHYLPHOSPHONIC ACID OR N METHYL AMPA OR NSC
            244826 OR PHOSPHONIC ACID METHYLAMINO METHYL OR PHOSPHONIC
            ACID P METHYLAMINO METHYL
L7          QUE SPE=ON  ABB=ON  PLU=ON  2 3 DIHYDROXY 1 OXOPROPYL AMINOMETH
            YL PHOSPHONIC ACID OR 2 3 DIHYDROXY 1 OXOPROPYL AMINOMETHYLPHOS
            PHONIC ACID OR N GLYCERYL AMPA
L8          QUE SPE=ON  ABB=ON  PLU=ON  3 OXO 3 PHOSPHONOMETHYL AMINO
            PROPANOIC ACID OR 3 OXO 3 PHOSPHONOMETHYL AMINOPROPANOIC ACID
            OR N MALONYL AMPA
L9          QUE SPE=ON  ABB=ON  PLU=ON  993-13-5 OR DIHYDROGEN METHYLPHOSPH
            ONATE OR METHANEPHOSPHONIC ACID OR METHYL PHOSPHONIC ACID OR
            METHYLPHOSPHONIC ACID OR NSC 119358 OR PHOSPHONIC ACID METHYL
            OR PHOSPHONIC ACID P METHYL
L10         QUE SPE=ON  ABB=ON  PLU=ON  (L6 OR L7 OR L8 OR L9)
            SAVE TEMP L10 GLY4/Q
L11         QUE SPE=ON  ABB=ON  PLU=ON  24569-83-3 OR 2 METHYL PHOSPHONOMET
            HYL AMINO ACETIC ACID OR 2 METHYL PHOSPHONOMETHYL AMINOACETIC
            ACID OR ACETIC ACID 2 N METHYL N PHOSPHONATOMETHYL AMINO OR
            GLYCINE N METHYL N PHOSPHONOMETHYL OR GLYPHOSATE N METHYL OR
            METHYL GLYPHOSATE
L12         QUE SPE=ON  ABB=ON  PLU=ON  METHYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR METHYL PHOSPHONOMETHYL AMINOACETIC ACID OR N
            METHYL N PHOSPHONOMETHYL GLYCINE OR N METHYLGLYPHOSATE OR N
            PHOSPHONOMETHYL N METHYL GLYCINE OR N PHOSPHONOMETHYL N
            METHYLGLYCINE
L13         QUE SPE=ON  ABB=ON  PLU=ON  (L11 OR L12)
            SAVE TEMP L13 GLY5/Q
            D COST FUL
L14         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
            HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
            IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
            EYE? OR IRRIT? OR SENSI? OR ALLERG?
L15         QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
            GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
            METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
            ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L16         QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
            CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
            OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
            OR HORMON? OR GONAD? OR DISRUPT?
L17         QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
            MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
            PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
            EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
            OCCUPAT?
L18         QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
            MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
            CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
            RISK ASSESSMENT?
L19         QUE SPE=ON  ABB=ON  PLU=ON  (L14 OR L15 OR L16 OR L17 OR L18)
            SAVE TEMP L19 TOX/Q
L20         QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
            OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
            METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
            MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L21         QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
            PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
            HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
            OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L22         QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
            OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L23         QUE SPE=ON  ABB=ON  PLU=ON  (L20 OR L21 OR L22)
            SAVE TEMP L23 RES/Q
L24         QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
            DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
            SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
            AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L25         QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
             OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
            OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
            ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
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L26       QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
          PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
          HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
          MOVEMENT OR REMOVAL OR DRINKING WATER OR WATER TREATMENT
          PROCESSES
L27       QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
          NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
          OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
          OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
          PERSISTENCE OR LIGAND
L28       QUE SPE=ON  ABB=ON  PLU=ON  (L24 OR L25 OR L26 OR L27)
          SAVE TEMP L28 FATE/Q
L29       QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
          ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
          BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
          EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT? OR BIODIVERS? OR
          PROTECTION GOALS OR ECO?
L30       QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
          OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
          OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
          OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
          OR ALG? OR CHIRON?
L31       QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
          LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
          INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
          APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L32       QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L33       QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
          FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
          RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
          ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
          PARASITOID
L34       QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
          OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
          OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
          MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
          NITROGEN
L35       QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
          SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
          ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
          OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
L36       QUE SPE=ON  ABB=ON  PLU=ON  (L29 OR L30 OR L31 OR L32 OR L33
          OR L34 OR L35)
          SAVE TEMP L36 ECO/Q

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 19:51:07 ON 01 JUL 2020


' Final search - update Jul 2020:

   FILE 'MEDLINE' ENTERED AT 10:56:11 ON 02 JUL 2020
CHARGED TO COST=113898
L1     3605 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L2      208 SEA SPE=ON  ABB=ON  PLU=ON  L1 AND ED>20200107
L3      206 SEA SPE=ON  ABB=ON  PLU=ON  L2 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L4       31 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L5        0 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND ED>20200224
L6      583 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L7        1 SEA SPE=ON  ABB=ON  PLU=ON  L6 AND ED>20200227
L8        1 SEA SPE=ON  ABB=ON  PLU=ON  L7 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L9       11 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L10       1 SEA SPE=ON  ABB=ON  PLU=ON  L9 AND ED>20200504
L11       1 SEA SPE=ON  ABB=ON  PLU=ON  L10 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L12     207 SEA SPE=ON  ABB=ON  PLU=ON  L3 OR L8 OR L11
          SAVE TEMP L12 GLYMEDL/A

   FILE 'AGRICOLA' ENTERED AT 11:20:29 ON 02 JUL 2020
CHARGED TO COST=113898
L13    7095 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L14     248 SEA SPE=ON  ABB=ON  PLU=ON  L13 AND ED>20200107
L15     248 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L16       6 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L17       2 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND ED>20200224
L18       2 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L19     123 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L20      11 SEA SPE=ON  ABB=ON  PLU=ON  L19 AND ED>20200227
L21      11 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L22       8 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L23       1 SEA SPE=ON  ABB=ON  PLU=ON  L22 AND ED>20200504
L24       1 SEA SPE=ON  ABB=ON  PLU=ON  L23 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L25     258 SEA SPE=ON  ABB=ON  PLU=ON  L15 OR L18 OR L21 OR L24
          SAVE TEMP L25 GLYAGRI/A

   FILE 'BIOSIS' ENTERED AT 11:32:39 ON 02 JUL 2020
CHARGED TO COST=113898
L26   10702 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
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L27       364 SEA SPE=ON  ABB=ON  PLU=ON  L26 AND ED>20200107
L28       316 SEA SPE=ON  ABB=ON  PLU=ON  L27 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L29        30 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L30         1 SEA SPE=ON  ABB=ON  PLU=ON  L29 AND ED>20200224
L31         1 SEA SPE=ON  ABB=ON  PLU=ON  L30 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L32       471 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L33         8 SEA SPE=ON  ABB=ON  PLU=ON  L32 AND ED>20200227
L34         6 SEA SPE=ON  ABB=ON  PLU=ON  L33 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L35        22 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L36         0 SEA SPE=ON  ABB=ON  PLU=ON  L35 AND ED>20200504
L37       321 SEA SPE=ON  ABB=ON  PLU=ON  L28 OR L31 OR L34
           SAVE TEMP L37 GLYBIOS/A

     FILE 'CABA' ENTERED AT 11:39:50 ON 02 JUL 2020
CHARGED TO COST=113898
L38     18563 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L39       466 SEA SPE=ON  ABB=ON  PLU=ON  L38 AND ED>20200107
L40       466 SEA SPE=ON  ABB=ON  PLU=ON  L39 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L41         5 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L42         0 SEA SPE=ON  ABB=ON  PLU=ON  L41 AND ED>20200224
L43        71 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L44         1 SEA SPE=ON  ABB=ON  PLU=ON  L43 AND ED>20200227
L45         1 SEA SPE=ON  ABB=ON  PLU=ON  L44 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L46        41 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L47         0 SEA SPE=ON  ABB=ON  PLU=ON  L46 AND ED>20200504
L48       467 SEA SPE=ON  ABB=ON  PLU=ON  L40 OR L45
           SAVE TEMP L48 GLYCABA/A

     FILE 'FSTA' ENTERED AT 11:46:51 ON 02 JUL 2020
CHARGED TO COST=113898
L49       507 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L50        22 SEA SPE=ON  ABB=ON  PLU=ON  L49 AND ED>20200107
L51        20 SEA SPE=ON  ABB=ON  PLU=ON  L50 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L52         1 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L53         0 SEA SPE=ON  ABB=ON  PLU=ON  L52 AND ED>20200224
L54         9 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L55         0 SEA SPE=ON  ABB=ON  PLU=ON  L54 AND ED>20200227
L56         2 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L57         0 SEA SPE=ON  ABB=ON  PLU=ON  L56 AND ED>20200504
           SAVE TEMP L51 GLYFSTA/A

     FILE 'PQSCITECH' ENTERED AT 11:51:22 ON 02 JUL 2020
CHARGED TO COST=113898
L58      5130 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L59       108 SEA SPE=ON  ABB=ON  PLU=ON  L58 AND ED>20200107
L60       105 SEA SPE=ON  ABB=ON  PLU=ON  L59 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L61        24 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L62         0 SEA SPE=ON  ABB=ON  PLU=ON  L61 AND ED>20200224
L63       294 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L64         1 SEA SPE=ON  ABB=ON  PLU=ON  L63 AND ED>20200227
L65         1 SEA SPE=ON  ABB=ON  PLU=ON  L64 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L66        12 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L67         0 SEA SPE=ON  ABB=ON  PLU=ON  L66 AND ED>20200504
L68       106 SEA SPE=ON  ABB=ON  PLU=ON  L60 OR L65
           SAVE TEMP L68 GLYPQSCI/A

     FILE 'TOXCENTER' ENTERED AT 11:56:52 ON 02 JUL 2020
CHARGED TO COST=113898
L69     15185 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L70       654 SEA SPE=ON  ABB=ON  PLU=ON  L69 AND ED>20200107
L71       463 SEA SPE=ON  ABB=ON  PLU=ON  L70 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L72        90 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L73         6 SEA SPE=ON  ABB=ON  PLU=ON  L72 AND ED>20200224
L74         2 SEA SPE=ON  ABB=ON  PLU=ON  L73 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L75      1244 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L76        12 SEA SPE=ON  ABB=ON  PLU=ON  L75 AND ED>20200227
L77         9 SEA SPE=ON  ABB=ON  PLU=ON  L76 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L78        40 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L79         1 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND ED>20200504
L80         1 SEA SPE=ON  ABB=ON  PLU=ON  L79 NOT (COMMENT? OR DISSERTATION
           OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
           T
L81       470 SEA SPE=ON  ABB=ON  PLU=ON  L71 OR L74 OR L77 OR L80
           SAVE TEMP L81 GLYTOXC/A

     FILE 'EMBASE' ENTERED AT 12:11:20 ON 02 JUL 2020
CHARGED TO COST=113898
L82      4354 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L83       162 SEA SPE=ON  ABB=ON  PLU=ON  L82 AND ED>20200107
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L84       160 SEA SPE=ON  ABB=ON  PLU=ON  L83 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L85        48 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L86         0 SEA SPE=ON  ABB=ON  PLU=ON  L85 AND ED>20200224
L87      1292 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L88         6 SEA SPE=ON  ABB=ON  PLU=ON  L87 AND ED>20200227
L89         6 SEA SPE=ON  ABB=ON  PLU=ON  L88 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L90        11 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L91         0 SEA SPE=ON  ABB=ON  PLU=ON  L90 AND ED>20200504
L92       166 SEA SPE=ON  ABB=ON  PLU=ON  L84 OR L89
          SAVE TEMP L92 GLYEMBA/A

   FILE 'ESBIOBASE' ENTERED AT 12:18:43 ON 02 JUL 2020
CHARGED TO COST=113898
L93      4837 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L94       204 SEA SPE=ON  ABB=ON  PLU=ON  L93 AND ED>20200107
L95       204 SEA SPE=ON  ABB=ON  PLU=ON  L94 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L96        15 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L97         0 SEA SPE=ON  ABB=ON  PLU=ON  L96 AND ED>20200224
L98       179 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L99         2 SEA SPE=ON  ABB=ON  PLU=ON  L98 AND ED>20200227
L100        2 SEA SPE=ON  ABB=ON  PLU=ON  L99 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L101       12 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L102        0 SEA SPE=ON  ABB=ON  PLU=ON  L101 AND ED>20200504
L103      206 SEA SPE=ON  ABB=ON  PLU=ON  L95 OR L100
          SAVE TEMP L103 GLYESBIO/A

   FILE 'HCAPLUS' ENTERED AT 12:25:03 ON 02 JUL 2020
CHARGED TO COST=113898
L104    24654 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L105      743 SEA SPE=ON  ABB=ON  PLU=ON  L104 AND ED>20200107
L106      346 SEA SPE=ON  ABB=ON  PLU=ON  L105 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L107      701 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L108        8 SEA SPE=ON  ABB=ON  PLU=ON  L107 AND ED>20200224
L109        3 SEA SPE=ON  ABB=ON  PLU=ON  L108 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L110     4029 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L111       36 SEA SPE=ON  ABB=ON  PLU=ON  L110 AND ED>20200227
L112       15 SEA SPE=ON  ABB=ON  PLU=ON  L111 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L113      120 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L114        0 SEA SPE=ON  ABB=ON  PLU=ON  L113 AND ED>20200504
L115      364 SEA SPE=ON  ABB=ON  PLU=ON  L106 OR L109 OR L112
          SAVE TEMP L115 GLYHCAP/A

   FILE 'SCISEARCH' ENTERED AT 12:30:36 ON 02 JUL 2020
CHARGED TO COST=113898
L116    11035 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q
L117      556 SEA SPE=ON  ABB=ON  PLU=ON  L116 AND ED>20200107
L118      553 SEA SPE=ON  ABB=ON  PLU=ON  L117 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L119       69 SEA SPE=ON  ABB=ON  PLU=ON  GLY3/Q
L120        2 SEA SPE=ON  ABB=ON  PLU=ON  L119 AND ED>20200224
L121        2 SEA SPE=ON  ABB=ON  PLU=ON  L120 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L122      876 SEA SPE=ON  ABB=ON  PLU=ON  GLY4/Q
L123       18 SEA SPE=ON  ABB=ON  PLU=ON  L122 AND ED>20200227
L124       18 SEA SPE=ON  ABB=ON  PLU=ON  L123 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
L125       28 SEA SPE=ON  ABB=ON  PLU=ON  GLY5/Q
L126        0 SEA SPE=ON  ABB=ON  PLU=ON  L125 AND ED>20200504
L127      571 SEA SPE=ON  ABB=ON  PLU=ON  L118 OR L121 OR L124
          SAVE TEMP L127 GLYSCIS/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 12:38:46 ON 02 JUL 2020
CHARGED TO COST=113898
L128     1648 DUP REM L12 L25 L37 L48 L51 L68 L81 L92 L103 L115... (1508 DUP
             ANSWERS '1-207' FROM FILE MEDLINE
             ANSWERS '208-430' FROM FILE AGRICOLA
             ANSWERS '431-639' FROM FILE BIOSIS
             ANSWERS '640-982' FROM FILE CABA
             ANSWERS '983-993' FROM FILE FSTA
             ANSWERS '994-1051' FROM FILE PQSCITECH
             ANSWERS '1052-1205' FROM FILE TOXCENTER
             ANSWERS '1206-1276' FROM FILE EMBASE
             ANSWERS '1277-1310' FROM FILE ESBIOBASE
             ANSWERS '1311-1424' FROM FILE HCAPLUS
             ANSWERS '1425-1648' FROM FILE SCISEARCH
          SAVE L128 GLY202007/A

L129     1317 SEA SPE=ON  ABB=ON  PLU=ON  L128 AND TOX/Q
          SAVE TEMP L129 GLYTOX/A
L130     1432 SEA SPE=ON  ABB=ON  PLU=ON  L128 AND RES/Q
          SAVE TEMP L130 GLYRES/A
L131      985 SEA SPE=ON  ABB=ON  PLU=ON  L128 AND FATE/Q
          SAVE TEMP L131 GLYFATE/A
```

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L132    1541 SEA SPE=ON  ABB=ON  PLU=ON  L128 AND ECO/Q
         SAVE TEMP L132 GLYECO/A
L133    1638 SEA SPE=ON  ABB=ON  PLU=ON  (L129 OR L130 OR L131 OR L132)
         SAVE L133 GLY202007FIN/A
         D TI 1-1638

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 17:01:53 ON 02 JUL 2020
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Literature Review Report

Scientific peer-reviewed open literature covering the publication period of July 2020 to December 2020 for the approval of pesticide active substance glyphosate and metabolites

as under Article 8(5) of Regulation (EC) No 1107/2009

(Ref. EFSA Journal 2011; 9(2) 2092)

Report number

113898-CA9-2

Author

Anonymous, 2022

Sponsor

[redacted]

Reporting Date

28 April 2022

Date of search(es):

5 January 2021

Content

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Disclaimer

The information contained herein has been obtained from sources believed to be the most reliable. Every effort has been made to ensure completeness of data. However, no database search can be completely comprehensive, and it is possible that relevant documents have been omitted.

All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

1 Summary

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document (GD) - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

In addition, a recommendation by the Assessment Group on Glyphosate (AGG)[5] on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 82) for more details.

This Literature Review Report summarizes the search and evaluation of the glyphosate scientific peer-reviewed open literature covering the publication period of July 2020 to December 2020 and is supplementary to the previous searches covering the publication period of January 2010 to June 2020.[6]

The literature search was conducted accessing 11 bibliographic databases via the service provider STN.

In total, 880 articles were identified upon removal of duplicates within the current search (July 2020 – December 2020) and articles found already in the previous searches (January 2010 – June 2020).
All 880 articles were subsequently assessed for their relevance at title/abstract level ("rapid assessment" according to the procedure and requirements stated in the EFSA 2092 GD).

A total of 786 of the 880 articles were identified as "non-relevant" in the rapid assessment (e.g. publications dealing with chemical synthesis, efficacy, analytical methods or publications which are not related to glyphosate or its metabolites) and excluded from further evaluation. Due to the large quantity of data, and as agreed with the AGG, the list of articles and the justification for their non-relevance is provided in a standalone Literature Review Excel File (Document ID: 113898_CA9-2_Literature Review Excel File).

For the remaining 94 articles, identified as potentially "relevant" or of "unclear relevance" in the rapid assessment, the full-text documents[7] were reviewed in detail ("detailed assessment").

A total of 30 articles of the remaining 94 articles were identified as "non-relevant" in the detailed assessment and were excluded from further evaluation. The list of the articles and the justification for their non-relevance is provided in **Table 38** of this Literature Review Report document.

The remaining 64 articles of the 94 articles were identified as "relevant" in the detailed assessment and

[1] (aminomethyl)phosphonic acid (AMPA), N-acetyl-AMPA, N-acetyl-glyphosate, (hydroxymethyl)phosphonic acid (HMPA), N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA, methylphosphonic acid and N-methylglyphosate.
[2] European Food Safety Authority, 2011: *Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) No 1107/2009.* EFSA Journal 2011;9(2):2092. 49 pp, doi:10.2903/j.efsa.2011.2092.
[3] Appendix to EFSA Journal 2011;9(2):2092. *Further guidance on performing and presenting the literature search.* Available online: https://efsa.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.2903/j.efsa.2011.2092&file=efs22092-sup-0001-Appendix.pdf
[4] European Food Safety Authority, 2019. *Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances.* EFSA supporting publication 2019:EN-1612. 49 pp., doi:10.2903/sp.efsa.2019.EN-1612.
[5] On 10th May 2019, the European Commission appointed four Member States (France, Hungary, the Netherlands and Sweden) to act jointly as 'rapporteurs' for the AIR5 process assessment of glyphosate. This group of Member States is known as the Assessment Group on Glyphosate (AGG).
[6] See Literature Review Reports 108689-CA9-1 and 113898-CA9-1 for more details.
[7] All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

were classified according to the EFSA 2092 GD (EFSA Journal 2011;9(2):2092, Point 5.4.1).

Category A Articles which provide data for establishing or refining risk assessment parameters. For all articles of Category A, a reliability assessment was performed as recommended in the EFSA 2092 GD. In addition, summaries were compiled for Category A articles classified as "reliable" or "reliable with restrictions". The list of these Category A & reliable / reliable with restrictions articles can be found in **Table 32** and **Table 33** of this Literature Review Report document.

Category B Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment. A justification for such decision is provided as recommended in the EFSA 2092 GD. The list of these Category B articles and the justifications can be found in **Table 34** and **Table 35** of this Literature Review Report document.

Category C Articles for which relevance cannot be clearly determined. As recommended in the EFSA 2092 GD, an explanation is provided why the relevance could not be determined. The list of these Category C articles and the explanations can be found in **Table 36** and **Table 37** of this Literature Review Report document.

The full outcome of the literature evaluation is provided in **Table 1**.

Table 1: Summary of the literature review

Section	Number of articles found	Rapid assessment (title/abstract level)		Detailed assessment (full-text level)	
		non-relevant articles	potentially relevant / unclear relevance	non-relevant articles	relevant articles (Category A+B+C)
Efficacy / Agronomy [a)]	372	372	n.a.	n.a.	n.a.
Analytical methods [a)]	67	67	n.a.	n.a.	n.a.
Other non-relevant categories [b)]	74	74	n.a.	n.a.	n.a.
Ecotoxicology	133	107	26	10	16
E-fate	91	84	7	4	3
Residues	26	15	11	2	9
Toxicology	117	67	50	14	36
Total	**880**	**786**	**94**	**30**	**64**

[a)] Efficacy / Agronomy (e.g. reporting desired effects on organisms to be controlled) and development of analytical methods (artificial measurements) do not provide information useful/required for the environmental or human safety risk assessment.

[b)] The category "other non-relevant categories" covers a wide range of scientific publications which are not related to glyphosate or its metabolites or are not related to exposure of humans or the environment to glyphosate or its metabolites and thus not relevant for the risk assessments.

The full outcome of the relevant articles after detailed (full-text) assessment is provided in **Table 2**.

Table 2: Relevant articles by full-text classified according to the EFSA 2092 GD, Point 5.4.1

	Relevant articles by full-text (EFSA 2092 GD, Point 5.4.1)		
Section	**Category A** [a)]	**Category B** [b)]	**Category C** [c)]
Ecotoxicology	3	12	1
E-fate	3	0	0
Residues	0	9	0
Toxicology	3	32	1
Total	**9**	**53**	**2**

[a)] Category A: Articles, which provide data for establishing or refining risk assessment parameters.
[b)] Category B: Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
[c)] Category C: Articles for which relevance cannot be clearly determined.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

Please refer to **Appendix 2** (page 83) to see the article selection process in detail.

2 Introduction

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA Supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

In addition, a recommendation by the Assessment Group on Glyphosate (AGG) on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 82) for more details.

In June 2020, a Literature Review Report (Document ID: 108689-CA9-1) summarizing results of the search of the glyphosate scientific peer-reviewed open literature published from January 2010 to December 2019 was submitted to the AGG as part of the glyphosate AIR5 dossier. In July 2020 during the dossier completeness check (point 23)[8], the AGG requested a top-up search for glyphosate open literature covering the publication period of January 2020 to June 2020. In October 2020, a Literature Review Report (Document ID: 113898-CA9-1) summarizing results of this top-up search was submitted to the AGG.

Furthermore, an additional top-up literature search of the glyphosate scientific peer-reviewed open literature was performed in January 2021 and the results of the search are summarized in this Literature Review Report (Document ID: 113898-CA9-2). The current search covers the publication period of July 2020 to December 2020. Details for this search are provided below.

The search has been conducted via the online service provider STN (www.stn-international.de) that provides access to a broad range of databases and to published research, journal literature, patents, structures, sequences, properties, and other data.

To offer a comprehensive literature search covering the requirements of the EFSA 2092 GD eleven databases have been used: AGRICOLA, BIOSIS, CABA, CAPLUS, EMBASE, ESBIOBASE, MEDLINE, TOXCENTER, FSTA, PQSCITECH, and SCISEARCH.

Please refer to **Table 3** for more details on the literature search.

[8] AGG's letter dated 10-July-2020, subject "Glyphosate: Check of completeness of the supplementary dossier for renewal of approval under Commission Implementing Regulation (EU) No 844/2012", section 2: Elements to be submitted in accordance with Article 11(5) of Regulation (EU) No 844/2012, point 23.

Table 3: Overview of the search conducted for glyphosate and its metabolites

Performed for	Covering publication period	Conducted on
Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	July 2020 – December 2020	5 January 2021

AMPA = (aminomethyl)phosphonic acid
HMPA = (hydroxymethyl)phosphonic acid

A "focused search for grouped data requirements"[9] have been performed (a combination of a substance basic input parameters, keywords and "search filters" defined for the four technical sections – toxicology, residues, environmental fate, and ecotoxicology).

Please refer to **Chapter 2.2** and **2.3** (pages 14 and 16) for the input parameters, keywords and search filters used in the literature search.

Regarding details on the bibliographic databases used in the literature search, please refer to **Chapter 2.1** (**Table 4**).

Regarding the number of articles retrieved in the literature search, please refer to **Chapter 2.1** (**Table 5**).

For the relevance and reliability assessment, please refer to **Chapter 2.4** and **2.5** (pages 19 and 22).

For the full outcome of the literature search and for the individual technical sections, please refer to **Chapter 3** (page 27).

[9] Citation from the EFSA 2092 Guidance Document: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

2.1 Bibliographic databases used in the literature search

Table 4: Overview of the databases used in the literature search

Data requirement(s) captured in the search	**Details of the search(es)**			
	1. AGRICOLA	**2. BIOSIS**	**3. CABA**	**4. CAPLUS**
Justification for choosing the source:	Provides literature from agriculture and related fields, e.g. biology, biotechnology, botany, ecology etc.	Provides the most comprehensive and largest life science literature, e.g. biosciences, biomedicine etc.	Provides literature from agriculture and related sciences, e.g. biotechnology, forestry, veterinary medicine etc.	Provides literature from chemistry and related fields, e.g. biochemistry, chemical engineering etc.
Number of records in the database at the time of search:	> 7.1 million (09/2020)	> 27.8 million (04/2019)	> 9.9 million (09/2020)	> 57.0 million (01/2022)
Database update:	Monthly	Weekly	Weekly	Daily updates bibliographic data; weekly updates indexing data
Date of the search:	05 January 2021	05 January 2021	05 January 2021	05 January 2021
Database covers records:	1970-present	1926-present	1973-present	1907-present and more than 180,000 pre-1907
Date of the latest database update:	7 December 2020	30 December 2020	05 January 2021	04 January 2021
Language limit:	No	No	No	No
Document types <u>excluded</u> that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	125	291	470	504

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	**Details of the search(es)**		
	5. MEDLINE	**6. EMBASE**	**7. TOXCENTER**
Justification for choosing the source:	Provides literature from every area of medicine.	Provides literature from biomedicinal and pharmaceutical fields, e.g. bioscience, biochemistry, human medicine, forensic science, paediatrics, pharmacy, pharmacology, drug therapy, psychiatry, public health, biomedical engineering, environmental science.	Provides literature on pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals.
Number of records in the database at the time of search:	> 33.5 million (01/2022)	> 34.3 million (08/2018)	> 16.2 million (01/2022)
Database update:	Six times each week, with an annual reload	Daily	Weekly
Date of the search:	05 January 2021	05 January 2021	05 January 2021
Database covers records:	1946-present	1974-present	1907-present
Date of the latest database update:	04 January 2021	04 January 2021	04 January 2021
Language limit:	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.		
Total number of records retrieved:	237	204	593

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	Details of the search(es)			
	8. FSTA	**9. PQSCITECH**	**10. ESBIOBASE**	**11. SCISEARCH**
Justification for choosing the source:	Provides literature on scientific and technological aspects of the processing and manufacture of human food products, e.g. biotechnology, hygiene and toxicology, engineering etc.	Provides a valuable and huge resource of literature (merge of 25 STN databases) from all science areas and technology; from engineering to lifescience.	Provides comprehensive literature on entire spectrum of biological and biosciences research, e.g. microbiology, biotechnology, ecological & environmental sciences, genetics, plant and crop science, toxicology and many more.	Provides one of the largest multidisciplinary scientific literature covering a broad field of sciences, technology, and biomedicine.
Number of records in the database at the time of search:	> 1.59 million (09/2020)	> 33.6 million (01/2021)	> 9.0 million (01/2021)	> 47.7 million (08/2019)
Database update:	Weekly	Monthly	Weekly	Weekly
Date of the search:	05 January 2021	05 January 2021	05 January 2021	05 January 2021
Database covers records:	1969-present	1962-present	1994-present	1974-present
Date of the latest database update:	29 December 2020	16 December 2020	30 December 2020	04 January 2021
Language limit:	No	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	37	95	200	541

Table 5: Total number of articles retrieved

Scope of the search	After automatic removal of duplicates within the databases in the current search (Jul 2020 – Dec 2020)	After applying search filters [a] within the current search (Jul 2020 – Dec 2020)	After manual removal of duplicates [b] within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020) [c]
July 2020 – December 2020 Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	**1797**	**1781**	**880**

[a] Search filters applied for the four technical sections (residues, environmental fate, toxicology and ecotoxicology). Please refer to **Chapter 2.3** for more details (page 16).

[b] Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[c] Please refer to the Literature Review Report (LRR) 108689-CA9-1 and 113898-CA9-1.

Note: LRR 108689-CA9-1 covers the publication period of 1 January 2010 to 31 December 2019, LRR 113898-CA9-1 covers the publication period of 1 January 2020 to 30 June 2020.

2.2 Input parameters used in the literature search

The basic input parameters used in the literature search, e.g. IUPAC, chemical name or CAS number, are provided in **Table 6 - Table 15**.

Table 6: Input parameters – active substance Glyphosate

Substance name	Glyphosate Salts: isopropylamine, potassium, ammonium, methylmethanamine
IUPAC / CA name	2-(phosphonomethylamino)acetic acid
CAS number(s)	1071-83-6 Salts: 38641-94-0, 70901-12-1, 39600-42-5, 69200-57-3, 34494-04-7, 114370-14-8, 40465-66-5, 69254-40-6

Table 7: Input parameters – metabolite AMPA

Substance name	AMPA
IUPAC / CA name	(aminomethyl)phosphonic acid
CAS number(s)	1066-51-9

Table 8: Input parameters – metabolite N-acetyl glyphosate

Substance name	N-acetyl glyphosate
IUPAC / CA name	N-acetyl-N-(phosphonomethyl)glycine
CAS number(s)	129660-96-4

Table 9: Input parameters – metabolite N-acetyl AMPA

Substance name	N-acetyl AMPA
IUPAC / CA name	[(acetylamino)methyl]phosphonic acid
CAS number(s)	57637-97-5

Table 10: Input parameters – metabolite HMPA

Substance name	HMPA
IUPAC / CA name	(hydroxymethyl)phosphonic acid
CAS number(s)	2617-47-2

Table 11: Input parameters – metabolite N-methyl AMPA

Substance name	N-methyl AMPA
IUPAC / CA name	[(methylamino)methyl]phosphonic acid
CAS number(s)	35404-71-8

Table 12: Input parameters – metabolite N-glyceryl AMPA

Substance name	N-glyceryl AMPA
IUPAC / CA name	(2,3-dihydroxypropanoylamino)methylphosphonic acid
CAS number(s)	No data

Table 13: Input parameters – metabolite N-malonyl AMPA

Substance name	N-malonyl AMPA
IUPAC / CA name	3-oxo-3-(phosphonomethylamino)propanoic acid
CAS number(s)	no data

Table 14: Input parameters – metabolite methylphosphonic acid

Substance name	methylphosphonic acid
IUPAC / CA name	methylphosphonic acid
CAS number(s)	993-13-5

Table 15: Input parameters – metabolite N-methylglyphosate

Substance name	N-methylglyphosate
IUPAC / CA name	2-[methyl(phosphonomethyl)amino]acetic acid
CAS number(s)	24569-83-3

2.3 Keywords and search filters used in the literature search

The approach used for the search was the "focused search for grouped data requirements"[10], which combines the active substance and metabolite basic input parameters, keywords and search filters defined for each technical section. Please refer to **Table 16** for more details on the keywords used and to **Table 17** - **Table 20** for the search filters.

Table 16: Keywords used for the active substance glyphosate and its metabolites

Gly1: Glyphosate and AMPA	glyphosat? OR glifosat? OR glyfosat? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR 69254-40-6 OR aminomethyl phosphonic OR aminomethylphosphonic OR 1066-51-9
Gly2: N-acetyl glyphosate and N-acetyl AMPA	2 acetyl phosphonomethyl amino acetic acid OR n acetyl glyphosate OR n acetylglyphosate OR n acetyl n phosphonomethyl glycine OR 129660-96-4 OR n acetyl ampa OR acetylamino methyl phosphonic acid OR acetylaminomethyl phosphonic acid OR 57637-97-5
Gly 3: HMPA	2617-47-2 OR hydroxymethanephosphonic acid OR hydroxymethyl phosphonate OR hydroxymethylphosphonate OR hydroxymethyl phosphonic acid OR hydroxymethylphosphonic acid OR methanehydroxyphosphonic acid OR phosphonic acid(1w)hydroxymethyl OR phosphonomethanol
Gly 4: N-methyl AMPA	35404-71-8 OR methylamino methyl phosphonic acid OR methylaminomethyl phosphonic acid OR methylaminomethylphosphonic acid OR n methyl ampa OR nsc 244826 OR phosphonic acid methylamino methyl OR phosphonic acid p methylamino methyl
Gly 4: N-glyceryl AMPA	2 3 dihydroxy 1 oxopropyl aminomethyl phosphonic acid OR 2 3 dihydroxy 1 oxopropyl aminomethylphosphonic acid OR n glyceryl ampa
Gly 4: N-malonyl AMPA	3 oxo 3 phosphonomethyl amino propanoic acid OR 3 oxo 3 phosphonomethyl aminopropanoic acid OR n malonyl ampa
Gly 4: methylphosphonic acid	993-13-5 OR dihydrogen methylphosphonate OR methanephosphonic acid OR methyl phosphonic acid OR methylphosphonic acid OR nsc 119358 OR phosphonic acid methyl OR phosphonic acid p methyl
Gly 5: N-methylglyphosate (NMG)	24569-83-3 OR 2 methyl phosphonomethyl amino acetic acid OR 2 methyl phosphonomethyl aminoacetic acid OR acetic acid 2 n methyl n phosphonatomethyl amino OR glycine n methyl n phosphonomethyl OR glyphosate n methyl OR methyl glyphosate OR methyl phosphonomethyl amino acetic acid OR methyl phosphonomethyl aminoacetic acid OR n methyl n phosphonomethyl glycine OR n methylglyphosate OR n phosphonomethyl n methyl glycine OR n phosphonomethyl n methylglycine

(1w) = proximity operator (this order, up to 1 word between)
AND / OR / NOT = boolean search operators
? = any character(s)

[10] Citation from the EFSA 2092 GD: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

Table 17: Search filters related to the technical section toxicology

Toxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR hazard? OR adverse OR health OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR in vivo OR in vitro OR invivo OR invitro OR mode of action OR skin? OR eye? OR irrit? OR sensi? OR allerg? OR rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR metabolism OR metabolite? OR metabolic OR distribution OR adsorption OR excretion OR elimination OR kinetic OR cytochrome OR enzym? OR gen? OR muta? OR chromos? OR clastogen? OR DNA OR carcino? OR cancer? OR tumor? OR tumour? OR oncog? OR oncol? OR malign? OR immun? OR neur? OR endocrin? OR hormon? OR gonad? OR disrupt? OR reproduct? OR development? OR malform? OR anomal? OR fertil? OR foet? OR fet? OR matern? OR pregnan? OR embryo? OR epidem? OR medical? OR poison? OR exposure OR operator? OR bystander? OR resident? OR worker? OR occupat? biomonitoring OR human exposure OR microbiome OR oxidative stress OR apoptosis OR necrosis OR cytotoxicity OR Polyoxyethyleneamine OR POEA OR surfactant OR risk assessment?

Table 18: Search filters related to the technical section residues

Residues [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
uptake OR translocation OR rumen OR storage stability OR storage OR stability OR metabolic OR metabolism OR breakdown OR nature of residues OR residue? OR magnitude of residues OR process? OR effects of processing OR dessicant OR preharvest OR preemerg? OR ?resistant? OR ?toleran? OR transgenic OR hydroly? OR rotation? OR succeed? OR plant? OR crop? OR feed? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig? OR dietary OR assessment OR risk assessment OR consum? OR exposure

Table 19: Search filters related to the technical section environmental fate

Environmental fate [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
soil OR water OR sediment OR degradat? OR photo? OR soil residues OR soil accumulat? OR soil contaminat? OR mobility OR sorption OR column leaching OR aged residue OR leach? OR lysimeter OR groundwater OR contaminat? OR microb? OR exudation OR rhizosphere OR dissipation OR saturated zone OR hydrolysis OR drift OR run-off OR runoff OR drainage OR volat? OR atmosphere OR long-range transport OR short-range transport OR transport OR micronutrient OR phosphate OR iron OR manganese OR half-life OR halflife OR half-lives OR halflives OR DT50 OR kinetics OR off-site movement OR removal OR drinking water OR water treatment processes OR atmospheric deposition OR tile-drains OR surface water OR monitoring data OR disinfectant OR ozone OR tillage OR infiltration OR hard surface OR rainwater OR rain water OR chelat? OR complex? OR mineralization OR persistence OR ligand

Table 20: Search filters related to the technical section ecotoxicology

Ecotoxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR ecotox? OR ?toxic OR ?toxicity OR hazard OR adverse OR endocrine disrupt? OR bioaccumulate? OR biomagnifi? OR bioconcentration OR poison OR effect OR indirect effect? OR direct effect? OR biodivers? OR protection goals OR eco? OR impact OR population OR community OR wildlife OR incident OR wildlife OR incident OR pest OR bird? OR acute OR chronic OR long-term OR mallard OR duck OR quail OR bobwhite OR Anas? OR Colinus? OR wild OR dietary OR aquatic OR fish OR daphni? OR alg? OR chiron? OR sediment dwell? OR benthic OR lemna OR marin? OR estuarine OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR plant AND submerge? OR emerge? OR bee? OR apis OR apidae OR bumble? OR colony OR hive OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR protection OR model? OR vole OR pest OR arthropod? OR beneficials OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR decompos? OR micro organisms OR microorganisms OR microbial OR carbon OR nitrogen OR plant? OR vegetative vigo? OR seedling OR germination OR monocot? OR dicot? OR sewage OR activated sludge OR biodegrad? OR bioaccumulation? OR amphib? OR reptile? OR aquatic plant OR beneficial

2.4 Relevance assessment

After removal of duplicates, the remaining articles were assessed for their relevance. First, at "title / abstract level" (so-called "rapid assessment") and second, at "full-text level" (so called "detailed assessment").
Articles that were identified as "non-relevant" in the rapid assessment were excluded from further evaluation and a justification for their non-relevance was provided.
For articles that were not excluded in the rapid assessment (potentially relevant articles and articles of an unclear relevance), a detailed relevance assessment of a full-text document was performed.
Articles that were identified as "non-relevant" in the detailed assessment were excluded from further evaluation and a justification for their non-relevance was provided.

For both assessments (rapid and detailed) the same criteria for non-relevance were applied (see **Chapter 2.4.1** and **2.4.2**).

2.4.1 Criteria applied for "non-relevance"

Articles identified as "non-relevant" in the rapid and detailed assessments belong to one of the following categories and were excluded from further evaluation. A justification for their non-relevance was provided.

- Publications related to efficacy (resistance related articles, new uses of control of pest / crops) or to agricultural / biological research (crop science, breeding, fertilization, tillage, fundamental plant physiology / micro- / molecular biology).
- Publications dealing with analytical methods / development.
- Publications describing new methods of synthesis (discovery / developments) or other aspects of basic (organic / inorganic) chemistry.
- Patents.
- Wastewater treatment.
- Abstracts referring to a conference contribution that does not contain sufficient data / information for regulatory risk assessment.
- Publications focusing on genetically modified organisms / transgenic crops; no data directly relevant to glyphosate evaluation (e.g. crop compositional analysis, gene flow, protein characterization).
- Publications where glyphosate or a relevant metabolite were not the focus of the publication.
- Secondary information including scientific and regulatory reviews[11].
- Articles dealing with political / socio / economic analysis.
- Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity).
- Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes.
- Findings not related to ecotoxicology, toxicology, residues, and environmental fate.
- Publications not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).

[11] Reviews have been partly evaluated on full text level as well – case by case decision.

- Publications dealing with a Roundup[12] formulation / other glyphosate formulations that is not the representative formulation for the AIR5 dossier and thus not relevant to the EU glyphosate renewal.
- Publications dealing with general pesticide exposures (not glyphosate specific).
- Publications generating endpoints that are not relatable to the EU level regulatory risk assessment (e.g. findings based on enzyme, cellular and molecular level etc.).
- Opinion articles where no new data is provided that can be used for the EU regulatory risk assessment.

2.4.2 Additional criteria for articles on the health and exposure of glyphosate

The scientific literature on the health effects of glyphosate can be subdivided in two main parts:

- Articles containing data on glyphosate acid and salts and on the reference glyphosate formulation MON 52276, and
- Articles only containing data on glyphosate formulations and/or co-formulants that have a composition different from that of the reference formulation MON 52276.

In the case of articles only relating to glyphosate formulations *in vitro* testing with the exception of cell/tissue systems[13] that are likely to come in direct contact with formulations and glyphosate formulations containing other active ingredients are excluded. The reason for the exclusion of *in vitro* testing of formulations to assess health effects as a result of systemic exposure is the presence of surfactants which produce cell toxicity based on the destabilization of the cell membrane and the mitochondrial membrane thus masking the specific toxicity of glyphosate. The toxicity of the co-formulants in combination with glyphosate is dependent on the concentration and the nature of the co-formulants and can be addressed on a case-by-case basis during the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

In the relevance of glyphosate data, those articles have been considered as not relevant (and reliable) for the assessment for systemic toxicity when only *in vitro* results are presented with glyphosate concentrations above 1 mM. This is because it is physiologically not possible to attain such concentrations in standard regulatory *in vivo* testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in *in vivo* test systems. It thus makes no sense to include such data in the risk assessment of glyphosate. Exceptions can be made in the event of direct contact with formulations resulting in localized effects, but then there is the contribution of the toxicity of the co-formulants which can be better addressed in the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

[12] Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contains a surfactant polyethoxylated tallow amine (also polyoxyethyleneamine, POEA) which is not permitted for use in the EU. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in articles dealing with POEA based Roundup formulations cannot be related to the representative formulation MON 52276 which is quaternary-ammonium based (and not POEA based).

[13] Glyphosate-based herbicides (GBH) contain surfactants that destabilize the cell membrane and the mitochondrial membrane and thus produce a toxicity that is not representative for glyphosate (see Levine S. L. et al, *Cell Biol. Toxicol. (2007) 23:385-400*). This has been clearly demonstrated in the scientific literature and also in some papers reviewed for this submission where *in vitro* glyphosate toxicity is compared against that of GBH and surfactants.

The limit of 1 mM has been based on the single dose oral pharmacokinetic data of a formulation containing 71.7% w/w glyphosate where an oral dose of 1,430 mg/kg bw in the rat gives plasma levels of 38.1 µg/mL or 0.225 mM after 2 hours. When extrapolated linearly (which is possible for glyphosate because it is not subject to hepatic metabolism) this gives plasma levels of 53.3 µg/mL or 0.315 mM at 2 hours after oral intake of 2,000 mg/kg bw and 107 µg/mL or 0.630 mM at 2 hours after oral intake of 4,000 mg/kg bw. A systemic concentration of glyphosate of 1 mM would then represent an oral dose of more than 6,000 mg/kg bw which is completely unreasonable for repeat dose experimental *in vivo* testing under today's OECD test guidelines. The ADI for glyphosate of 0.5 mg/kg bw/day corresponds with a daily systemic concentration of 0.17 µg/mL or 1 µM when a 60 kg person with 36 L extracellular fluid is considered with a glyphosate oral bioavailability of 20%. The daily systemic dose of glyphosate on the day of application (i.e. highest exposure day), based on the geometric mean of 3.2 µg/L in urine, of glyphosate applicators in the US is approx. 0.0001 mg/kg bw/day (Acquavella, 2004[14]) which is 1000 times less than the systemic dose (0.1 mg/kg bw) corresponding with the ADI oral dose of 0.5 mg/kg bw with 20% oral bioavailability.

Many articles that have been considered relevant for the risk assessment of glyphosate and have been assessed for reliability on full text basis, contain experimental data as well on glyphosate as such as on formulations (different from MON 52276) and co-formulants. In such cases, only the toxicology data pertinent to glyphosate and to the reference formulation (if that can be clearly stated by the author of the article) are summarized and discussed. In the case of articles on exposure monitoring and epidemiology, exposure to glyphosate formulations are considered.

2.4.3 Categorization of "relevant" articles at full-text level

Articles that were not excluded in the detailed assessment (see **Chapter 2.4.1** and **2.4.2**) were categorized as recommended in the EFSA 2092 GD - EFSA Journal 2011;9(2):2092, Point 5.4.1.

Category A *Studies that provide data for establishing or refining risk assessment parameters. These studies should be summarised in detail following the subsequent steps of the OECD Guidance documents (OECD, 2005; 2006) and should be considered for reliability.*

Category B Studies that are relevant to the data requirement, but in the opinion of the applicant provide only supplementary information that does not alter existing risk assessment parameters. A justification for such a decision should be provided.

Category C Studies for which relevance cannot be clearly determined. For each of these studies the applicants should provide an explanation of why the relevance of such studies could not be definitively determined.

The list of Category A articles can be found in **Table 32** and **Table 33**. The list of Category B articles and the justifications can be found in **Table 34** and **Table 35**. The list of Category C articles and the explanations can be found in **Table 36** and **Table 37**.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

[14] Acquavella J. F. *et al.* (2004), Environmental Health Perspectives, 112(3), 321-326.

2.5 Reliability assessment

For articles, which were identified, in the detailed assessment, as relevant articles of Category A (see **Chapter 2.4.3**) a reliability assessment was performed. The reliability criteria for each technical section are summarized in **Table 21 - Table 23**.

For relevant articles of Category A that were classified either as reliable (without restrictions) or reliable with restrictions, summaries were compiled.
Articles of Category A which were classified as non-reliable were downgraded to articles of Category B and justification for such a decision was provided.

Table 21: Reliability criteria for ecotoxicology, environmental fate and residues

Applied for	Reliability criteria
Ecotoxicology, Environmental Fate, Residues	For guideline-compliant studies (GLP studies): OECD, OPPTS, ISO, and others. The validity/quality criteria listed in the corresponding guidelines are met.
Ecotoxicology, Environmental Fate, Residues	(No) previous exposure to other chemicals is documented (where relevant).
Ecotoxicology	For aquatic studies, the test substance is dissolved in water or where a carrier is required, it is appropriate (non-toxic) and a carrier control / positive control is considered in the test design.
Environmental Fate, Residues	The test substance is dissolved in water or non-toxic solvent.
Ecotoxicology, Environmental Fate, Residues	Test item is sufficiently documented, and reported (i.e. purity, source, content, storage conditions).
Ecotoxicology	For tests including vertebrates, compliance of the batches used in toxicity studies compared to the technical specification.
Ecotoxicology	Species used in the experiment are clearly reported, including source, experimental conditions (where relevant): strain, adequate age/life stage, body weight, acclimatization, temperature, pH, oxygen (dissolved oxygen for aquatic tests) content, housing, light conditions, humidity (terrestrial species) incubation conditions, feeding.
Ecotoxicology	The validity criteria from relevant test guidelines can be extrapolated across different species but not necessarily across different test designs. If different, then the nature of the difference and impact should ideally be discussed.
Ecotoxicology, Environmental Fate, Residues	Only glyphosate or its metabolites is the test substance (excluding mixture), and information on application of the test substance is described.
Ecotoxicology, Environmental Fate, Residues	The endpoint measured can be considered a consequence of glyphosate (or a glyphosate metabolite).
Ecotoxicology, Environmental Fate, Residues	Study design / test system is well described, including when relevant: concentration in exposure media (dose rates, volume applied, etc.), dilution/mixture of test item (solvent, vehicle) where relevant.
Ecotoxicology, Environmental Fate, Residues	Analytical verifications performed in test media (concentration) / collected samples, stability of the test substance in test medium should be documented.

Applied for	**Reliability criteria**
Ecotoxicology	The test has been performed in several dose levels (at least 3) including a positive / negative control where relevant.
Ecotoxicology	Suitable exposure throughout the whole exposure period was demonstrated and reported.
Ecotoxicology	A clear concentration response relationship is reported – in studies where the dose response test design is employed.
Ecotoxicology	A sufficient number of animals per group to facilitate statistical analysis reported: mortality in control groups reported, observations/findings in positive/negative control clearly reported (where relevant).
Ecotoxicology, Environmental Fate, Residues	Assessment of the statistical power of the assay is possible with reported data.
Ecotoxicology, Environmental Fate, Residues	Statistical methodology is reported (e.g., checking the plots and confidence intervals).
Ecotoxicology	Description of the observations (including time-points), examinations, and analyses performed, with (where relevant) dissections being well documented.
Ecotoxicology	For terrestrial ecotoxicological studies in the laboratory or the field, the substrates used should be adequately described e.g. nature of substrate i.e. species of leaf or soil type.
Ecotoxicology, Environmental Fate, Residues	Field locations relevant / comparable to European conditions.
Ecotoxicology, Environmental Fate, Residues	Characterization of soil: texture (sandy loam, silty loam, loam, loamy sand), pH (5.5-8.0), cation exchange capacity, organic carbon (0.5-2-5%), bulk density, water retention, microbial biomass (~1% of organic carbon).
Ecotoxicology, Environmental Fate	Other soils where information on characterization by the parameters: pH, texture, CEC, organic carbon, bulk density, water holding capacity, microbial biomass.
Ecotoxicology, Environmental Fate, Residues	For tests including agricultural soils, they should not have been treated with test substance or similar substances for a minimum of 1 year.
Ecotoxicology, Environmental Fate	For soil samples, sampling from A-horizon, top 20 cm layers; soils freshly from field preferred (storage max 3 months at 4 +/- 2°C).
Ecotoxicology, Environmental Fate, Residues	Data on precipitation is recorded.
Environmental Fate	The temperature was in the range between 20-25°C and the moisture was reported.
Environmental Fate	The presence of glyphosate identified in samples were collected from European groundwater, soil, surface waters, sediments or air.
Ecotoxicology	For lab terrestrial studies, the temperature was appropriate to the species being tested and generally should fall within the range between 20-25°C and soil moisture / relative humidity was reported.
Ecotoxicology	For bee studies, temperature of the study should be appropriate to species.
Ecotoxicology	For lab aquatic studies:
	The source and / or composition of the media used should be described.
	The temperature of the water should be appropriate to the species being tested and generally fall within the 15-25ºC.

Applied for	Reliability criteria
Ecotoxicology, Residues	The residue data can be linked to a clearly described GAP table, appropriate in the context of the renewal of approval of glyphosate (crop, application method, doses, intervals, PHI).
Ecotoxicology, Environmental Fate, Residues	Analytical results present residues measurements which can be correlated with the existing residues definition of glyphosate, and where relevant its metabolites.
Ecotoxicology, Environmental Fate, Residues	Analytical methods are clearly described; and adequate statement of specificity and sensitivity of the analytical methods is included.
Ecotoxicology	Assessment of the ECX for the width of the confidence interval around the median value; and the certainty on the level of protection offered by the median ECX is reported.
Environmental Fate	Radiolabel characterization: purity, specific activity, location of label is reported.
Environmental Fate	If degradation kinetics are included: data tables / model description / statistical parameters for kinetic fit to be provided.
Environmental Fate, Residues	Monitoring data: description of matrix analysed, and analytical methods to be fully described.
Environmental Fate	Clear description of application rate and relevance to approved uses.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 22: Reliability criteria for toxicology – epidemiology and exposure studies

Reliability criteria – toxicology	
Epidemiology studies	**Exposure studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines/practices.	Study in accordance to valid internationally accepted testing guidelines/practices.
Study completely described and conducted following scientifically acceptable standards.	Study performed according to GLP.
	Study completely described and conducted following scientifically acceptable standards.
Test substance	**Test substance**
Exposure to formulations with only glyphosate as a.i.	Exposure to formulations with only glyphosate as a.i.
Exposure to formulations with glyphosate combined with other a.i.	Exposure to formulations with glyphosate combined with other a.i.
Exposure to various formulations of pesticides.	Exposure to various formulations of pesticides.
Study	**Study**
Study design – epidemiological method followed.	Study design clearly described.
Description of population investigated.	Population investigated sufficiently described.
Description of exposure circumstances.	Exposure circumstances sufficiently described.
Description of results.	Sampling scheme sufficiently documented.
Have confounding factors been considered.	Analytical method described in detail.
Statistical analysis.	Validation of analytical method reported.
	Monitoring results reported.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 23: Reliability criteria for toxicology – *in vitro* and *in vivo* studies

Reliability criteria – toxicology and metabolism	
***In vitro* studies**	***In vivo* studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines.	Study in accordance to valid internationally accepted testing guidelines.
Study performed according to GLP.	Study performed according to GLP.
Study completely described and conducted following scientifically acceptable standards.	Study completely described and conducted following scientifically acceptable standards.
Test substance	**Test substance**
Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions).	Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions).
Only glyphosate acid or one of its salts is the tested substance .	Only glyphosate acid or one of its salts is the tested substance.
AMPA or other glyphosate metabolite is the tested substance.	AMPA or other glyphosate metabolite is the tested substance.
Study	**Study**
Test system clearly and completely described.	Test species clearly and completely described.
Test conditions clearly and completely described.	Test conditions clearly and completely described.
Metabolic activation system clearly and completely described.	Route and mode of administration described.
Test concentrations in physiologically acceptable range (< 1 mM).	Dose levels reported.
Cytotoxicity tests reported.	Number of animals used per dose level reported.
Positive and negative controls.	Method of analysis described for analysis test media.
Complete reporting of effects observed.	Validation of the analytical method.
Statistical methods described.	Analytical verifications of test media.
Historical negative and positive control data reported.	Complete reporting of effects observed.
Dose-effect relationship reported.	Statistical methods described.
	Historical control data of the laboratory reported.
	Dose-effect relationship reported.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

3 Search results

The full outcome of the literature search and evaluation is provided below.

Table 24: Summary of the literature search – all technical sections

	Number	Justification
Total number of articles retrieved from the search.	3297	n.a.
Total number of articles after removal of duplicates within all databases.	1781	n.a.
Total number of articles after manual removal of duplicates. [a)]	880	n.a.
Number of articles excluded after rapid assessment (title / abstract).	786	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	94	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	30	See Table 38
Number of articles not excluded after detailed assessment. [b)]	64	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	9	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 25: Results of the article selection process for ecotoxicology

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	133	n.a.
Number of articles excluded after rapid assessment (title / abstract).	107	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	26	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	10	See Table 38
Number of articles not excluded after detailed assessment. [b)]	16	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	3	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 26: Results of the article selection process for environmental fate

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	91	n.a.
Number of articles excluded after rapid assessment (title / abstract).	84	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	7	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	4	See Table 38
Number of articles not excluded after detailed assessment. [b)]	3	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	3	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 27: Results of the article selection process for residues

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	26	n.a.
Number of articles excluded after rapid assessment (title / abstract).	15	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	11	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	2	See Table 38
Number of articles not excluded after detailed assessment [b)]	9	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	0	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 28: Results of the article selection process for toxicology

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	117	n.a.
Number of articles excluded after rapid assessment (title / abstract).	67	See the Literature Review Excel File.
Total number of full-text documents assessed in detail	50	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	14	See Table 38
Number of articles not excluded after detailed assessment [b)]	36	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	3	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 29: Results of the article selection process for analytical methods

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	67	n.a.
Number of articles excluded after rapid assessment (title / abstract).	67	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment [b)]	n.a.	n.a.
Number of summaries presented in the dossier [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 30: Results of the article selection process for efficacy / agronomy

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	372	n.a.
Number of articles excluded after rapid assessment (title / abstract).	372	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b)]	n.a.	n.a.
Number of summaries presented in the dossier. [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 31: Results of the article selection process for "other non-relevant categories"

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	74	n.a.
Number of articles excluded after rapid assessment (title / abstract).	74	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b)]	n.a.	n.a.
Number of summaries presented in the dossier. [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jul 2020 – Dec 2020) and entries found already in the previous searches (Jan 2010 – Jun 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 32: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
1	CA 5.8.3	Ferramosca A. et al.	2021	Herbicides glyphosate and glufosinate ammonium negatively affect human sperm mitochondria respiration efficiency.	Reproductive Toxicology (2021), Vol. 99, pp. 48-55	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
2	CA 5.9.4	Shrestha S. et al.	2020	Pesticide use and incident Parkinson's disease in a cohort of farmers and their spouses.	Environmental Research (2020), Vol. 191, Article No. 110186	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.
3	CA 5.9.4	Werder E. J. et al.	2020	Herbicide, fumigant, and fungicide use and breast cancer risk among farmers' wives.	Environmental Epidemiology (2020), Vol. 4, No. 3, Article No. e097	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.
4	CA 7.1.4.2	Albers C. N. et al.	2020	Leaching of herbicidal residues from gravel surfaces - A lysimeter-based study comparing gravels with agricultural topsoil.	Environmental pollution (2020), Vol. 266, Article No. 115225	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
5	CA 7.5	Papagiannaki D. et al.	2020	Effect of UV-A, UV-B and UV-C irradiation of glyphosate on photolysis and mitigation of aquatic toxicity.	Scientific Reports (2020), Vol. 10, No. 1, Article No. 20247	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.
6	CA 7.5	Tauchnitz N. et al.	2020	Assessment of pesticide inputs into surface waters by agricultural and urban sources - A case study in the Querne/Weida catchment, central Germany.	Environmental pollution (2020), Vol. 267, Article No. 115186	The article describes pesticide analyses, amongst them glyphosate, in surface waters and in soil samples within a German catchment area (CA 7.5). Additionally, batch adsorption (CA 7.1.3) and anaerobic soil degradation experiments (CA 7.1.1.2) were conducted. For CA 7.5, the article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for CA 7.5 is provided. For CA 7.1.1.2 and CA 7.1.2, refer to Table 34 and Table 35 (below). In order to complete the final statistics in this literature review report (see chapter *Summary* and *Search results*), the article has been allocated under Category A despite the outcome on CA 7.1.1.2 and CA 7.1.2.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
7	CA 8.2.2, CA 8.2.2.1, CP 10.2.2	Forner-Piquer I. et al.	2021	Differential impact of dose-range glyphosate on locomotor behavior, neuronal activity, glio-cerebrovascular structures, and transcript regulations in zebrafish larvae.	Chemosphere (2021), Vol. 267, Article No. 128986	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
8	CA 8.2.2, CP 10.2.2	Du-Carree J. L. et al.	2021	Impact of chronic exposure of rainbow trout, Oncorhynchus mykiss, to low doses of glyphosate or glyphosate-based herbicides.	Aquatic toxicology (2021), Vol. 230, Article No. 105687	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
9	CA 8.3.1.4, CP 10.3.1.5, CP 10.3.1.6	Odemer R. et al.	2020	Chronic High Glyphosate Exposure Delays Individual Worker Bee (Apis mellifera L.) Development under Field Conditions.	Insects (2020), Vol. 11, No. 10, Article No. 664	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.

Table 33: Relevant (category A) & reliable or reliable with restrictions articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
4	Albers C. N. et al.	CA 7.1.4.2	2020	Leaching of herbicidal residues from gravel surfaces - A lysimeter-based study comparing gravels with agricultural topsoil.	Environmental pollution (2020), Vol. 266, Article No. 115225	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
8	Du-Carree J. L. et al.	CA 8.2.2, CP 10.2.2	2021	Impact of chronic exposure of rainbow trout, Oncorhynchus mykiss, to low doses of glyphosate or glyphosate-based herbicides.	Aquatic toxicology (2021), Vol. 230, Article No. 105687	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
1	Ferramosca A. et al.	CA 5.8.3	2021	Herbicides glyphosate and glufosinate ammonium negatively affect human sperm mitochondria respiration efficiency.	Reproductive Toxicology (2021), Vol. 99, pp. 48-55	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
7	Forner-Piquer I. et al.	CA 8.2.2, CA 8.2.2.1, CP 10.2.2	2021	Differential impact of dose-range glyphosate on locomotor behavior, neuronal activity, glio-cerebrovascular structures, and transcript regulations in zebrafish larvae.	Chemosphere (2021), Vol. 267, Article No. 128986	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
9	Odemer R. et al.	CA 8.3.1.4, CP 10.3.1.5, CP 10.3.1.6	2020	Chronic High Glyphosate Exposure Delays Individual Worker Bee (Apis mellifera L.) Development under Field Conditions.	Insects (2020), Vol. 11, No. 10, Article No. 664	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.
5	Papagiannaki D. et al.	CA 7.5	2020	Effect of UV-A, UV-B and UV-C irradiation of glyphosate on photolysis and mitigation of aquatic toxicity.	Scientific Reports (2020), Vol. 10, No. 1, Article No. 20247	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.
2	Shrestha S. et al.	CA 5.9.4	2020	Pesticide use and incident Parkinson's disease in a cohort of farmers and their spouses.	Environmental Research (2020), Vol. 191, Article No. 110186	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
6	Tauchnitz N. et al.	CA 7.5	2020	Assessment of pesticide inputs into surface waters by agricultural and urban sources - A case study in the Querne/Weida catchment, central Germany.	Environmental pollution (2020), Vol. 267, Article No. 115186	The article describes pesticide analyses, amongst them glyphosate, in surface waters and in soil samples within a German catchment area (CA 7.5). Additionally, batch adsorption (CA 7.1.3) and anaerobic soil degradation experiments (CA 7.1.1.2) were conducted. For CA 7.5, the article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for CA 7.5 is provided. For CA 7.1.1.2 and CA 7.1.2, refer to Table 34 and Table 35 (below). In order to complete the final statistics in this literature review report (see chapter *Summary* and *Search results*), the article has been allocated under Category A despite the outcome on CA 7.1.1.2 and CA 7.1.2.
3	Werder E. J. et al.	CA 5.9.4	2020	Herbicide, fumigant, and fungicide use and breast cancer risk among farmers' wives.	Environmental Epidemiology (2020), Vol. 4, No. 3, Article No. e097	The article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for this article is provided.

Table 34: Relevant but supplementary (category B) articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
10	CA 5.1	Faniband M. H. et al.	2021	Human experimental exposure to glyphosate and biomonitoring of young Swedish adults.	International journal of hygiene and environmental health (2021), Vol. 231, Art. No. 113657	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides only supplementary information on kinetics of glyphosate in human volunteers but not altering risk assessment. No information on the test item and its source or purity. Only one dose level was tested and biomonitoring was restricted to urinary excretion.
11	CA 5.4, CA 5.5, CA 5.6	Skanes B. et al.	2021	Hazard assessment using an in-silico toxicity assessment of the transformation products of boscalid, pyraclostrobin, fenbuconazole and glyphosate generated by exposure to an advanced oxidative process.	Toxicology in vitro : an international journal published in association with BIBRA (2021), Vol. 70, Art. No. 105049	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: Article provides only supplementary information on in silico evaluation of genotoxicity, acute oral toxicity or carcinogenicity but not altering risk assessment. Only one type of software was used for each endpoint. Toxtree was used to address Cramer classification, Ames test, carcinogenicity / mutagenicity, DNA binding and micronucleus assay. Toxicity estimation software tool (TEST) was used to address developmental toxicity and the rat oral LD50. The toxicity evaluation based on single software was considered not robust enough.
12	CA 5.5	Crump K. et al.	2020	Correcting for Multiple Comparisons in Statistical Analysis of Animal Bioassay Data.	Toxicological Sciences (2020) Vol. 177, Issue 2, pp. 523-524	The article has been classified as relevant by full text - Category B for the following reason: In this letter to Editor Crump et al. (2021) commented on Rusyn et al. (*Questioning Existing Cancer Hazard Evaluation Standards in the Name of Statistics. Toxicol Sci. (2020), Vol. 177, Issue 2, pp. 521-522*) where Rusyn et al. comments on the original Crump et al. article (*Accounting for Multiple Comparisons in Statistical Analysis of the Extensive Bioassay Data on Glyphosate. Toxicol Sci. (2020) Vol. 175, Issue 2, pp. 156-167*). The original Crump et al. article was evaluated in the previous search and classified as relevant by full text (Category A and reliable without restrictions). The summary of the article was presented in the dossier under MCA 5.5./026. The appropriateness of the approach presented in the original article has been further reiterated in a Letter to the Editor (*Crump K. et al., Toxicological Sciences (2020), Vol. 177, Issue 2, pp. 523-524, Correcting for Multiple Comparisons in Statistical Analysis of Animal Bioassay Data*). Crump et al. replied to Rusyn et al. (*Questioning existing cancer hazard evaluation standards in the name of statistics. Toxicol Sci. (2020), Vol. 177, Issue 2, pp. 521-522*) and explain that the statistical method used in their analysis of the extensive bioassay data on glyphosate provides adequate interpretation of the p-values. They state that before a p-value can be interpreted appropriately, it must be correct, i.e., it must reflect the correct false positive rate for the hypothesis under consideration. The statistical method used in their analysis of the extensive bioassay data on glyphosate provides p-values that correct false positive rates by properly accounting for the multitude of tumours that require analysis by standard statistical methods. As the Letter to the Editor provides only supplementary information to the original Crump et al. article and does not alter risk assessment, the letter was

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						classified as relevant by full text but of Category B (relevant but supplementary).
13	CA 5.6, CA 5.8.3	Lorenz V. et al.	2020	Perinatal exposure to glyphosate or a glyphosate-based formulation disrupts hormonal and uterine milieu during the receptive state in rats.	Food and chemical toxicology (2020), Vol. 143, Art. No. 111560	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article is not reliable for the following reason: The study does not follow any OECD testing guideline, therefore the experimental design and procedures should be not only explained but validated against appropriate reference substances and the interpretation of the results should be supported by adequate historical control data that allow the correct interpretation of the relevance of a change. This is particularly true when assessing the biological relevance of hormonal changes and/or the assessed gene expression. In this publication such data are not provided. It is not clear why only 9 F1 females/group were selected to assess the effects on the pre-implantation phase and not a higher number to cover the basal hormonal variations observed, which should be high based on the scattered values observed in the control group of this study. The authrors claim that there was an imbalance in the serum levels of estradiol 2 in relation to progesterone, but the progesterone values were apparently not impacted. Similarly, they claim that glyphosate induced significantly the ERα expression at protein level subepithelial stroma of the uteri (which was not observed in other parts of the uterus), although no changes were observed in ERα mRNA expression but do not take into consideration the inconsistency of their results. Similarly, they concluded that glyphosate provoked aberrant expression on implantation-genes although a consistent response was not observed among all the tested genes. The reproductive performance data of F1 females is not reported in a transparent way: only selected photos of the uterus are presented to indicate that there was a decrease in the number of implantation sites. However, the actual number of the implantation sites per animals are not reported. Similarly the number of corpora lutea, resorption sites and preimplantation loss are represented in graphics (figure 2A, B and C), but the actual number have not been given. So, the authors do not provide the reader of an objective information to understand whether an effect did occur. Overall, this publication presents several deficiencies and bias in reporting the results of their investigations and as such is considered to be not reliable.
14	CA 5.6.1	Milesi M. M. et al.	2020	Correction to: Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats (Correction to Archives of Toxicology (2019) 93:3635–3638).	Archives of Toxicology (2020), Vol. 94, No. 8, pp. 2897–2898	The article has been classified as relevant by full text - Category B for the following reason: This is a serie of comments and corrections connected to the article by Milesi et al. (*Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2018), Vol. 92, No. 8, pp. 2629-2643*). This article was evaluated in the previous search and classified as relevant by full text - Category B. In order to reflect the category of the main article, the correction was also classified as Category B. The correction corrects Table 1 of the publication, which lists factors associated with the pre-implantation loss rate and factors associated with feto-placental parameters of F2 offspring in control and glyphosate-based herbicede-treated female rats.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						The serie contains e.g. following articles, comments and corrections: Milesi et al., Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2018);92(8):2629-2643. Plewis, Comment on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2019);93(1):207. Milesi et al., Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2019);93(12):3635-3638. Paumgartten, Comment on Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats, Arch Toxicol 92:2629-2643 : On the impairment of female reproductive performance by developmental exposure to a glyphosate-based herbicide. Arch Toxicol. (2019);93(3):831-832. Plewis, Comment on response from Milesi et al. to Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2020);94(1):351-352. Milesi et al., Correction to: Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2020);94(8):2897-2898.
15	CA 5.6.2	Refaie A. A. et al.	2020	DNA and liver damage induced by glyphosate herbicide in suckling pups of wistar rat.	Current Topics in Toxicology (2020), Vol. 16, pp. 205-214	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article is not reliable for the following reason: Storage conditions of test item not reported. Animal strain not further specified and age of dams not reported. No analysis of test item in solvent performed. Insufficient number of animals/group tested. It should be noted that the experimental unit for such an experimental design is the litter, not the individual pups. Therefore, statistical evaluations should have been conducted to compare across litters, where n = 2, affording only one degree of freedom for statistical comparisons.
16	CA 5.7	Coullery R. et al.	2020	Exposure to glyphosate during pregnancy induces neurobehavioral alterations and downregulation of Wnt5a-CaMKII pathway.	Reproductive toxicology (2020), Vol. 96, pp. 390-398	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides useful information on neonates rats administered glyphosate after gestational exposure, but not altering risk assessment. In addition, IP injection is not a preferred route of administration for human exposure. Only 2 dose levels were tested and no information on the purity of glyphosate was reported. No analytical determinations performed. No historical control data provided. Lack of positive control and information allowing to assess the robustness of the investigations and results.
17	CA 5.7	Masood M. I. et al.	2020	Environment permissible concentrations of glyphosate in drinking water can influence the fate of neural	Environmental pollution (2020), Vol. 270, Art. No. 116179	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on neurotoxicty (in vitro experiment), but does not alter risk assessment. The reporting on the test material is limited. Ca2+ uptake

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				stem cells from the subventricular zone of the postnatal mouse.		was investigated at too high concentrations not relevant for assessment (> 1mM), but the remaining endpoints were investigated at suitable concentrations (< 1 mM). No positive or negative controls were included and historical control data were not provided.
18	CA 5.8.2	Babich R. et al.	2020	Kidney developmental effects of metal-herbicide mixtures: Implications for chronic kidney disease of unknown etiology.	Environment international (2020), Vol. 144, Art. No. 106019	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on kidney effects of glyphosate and does not alter risk assessment. The purpose of the publication was to investigate the possible causes of chronic kidney disease of unknown etiology (CKDu) which is an emerging global concern affecting several agricultural communities in the Americas and South Asia. The hypothesis was that exposure to contaminants such as heavy metals (e.g., Cd, As, Pb, and V) and organic pesticides (e.g., glyphosate) present in the drinking water could provoke the onset and progression of this disease in childhood. Using zebrafish Danio rerio, a toxicology and kidney disease model, the authors examined kidney developmental effects of exposure to (i) environmentally derived samples from CKDu endemic and non-endemic regions and (ii) Cd, As, V, Pb, and glyphosate as individual compounds and in mixtures. The authors found that drinking water is contaminated with various organic chemicals including nephrotoxic compounds as well as heavy metals, but at levels considered safe for drinking. Histological studies and gene expression analyses examining markers of kidney development (pax2a) and kidney injury (kim1) showed novel metal and glyphosate-metal mixture specific effects on kidney development. Glyphosate showed that interactive nephrotoxic effects of organic agrochemicals and heavy metals are an important consideration. For example, glyphosate at 10 ppb can induce kim1, implying that exposure to this chemical even at very low-levels can contribute to kidney injury. They postulate that exposure to glyphosate coupled with individuals with impaired kidney development is likely to increase the initiation and progression of CKDu. However, gene expression data also suggest, when in a mixture with metals such as arsenic, glyphosate may have alternate effects on kidneys, including effects that may not be detrimental. Test system of the study is not clearly and completely described. Metabolic activation system is not clearly and completely described. Cytotoxicity tests are not reported. Only 1 dose level was used which does not allow a dose response analysis. Furthermore, no positive control and no HCD provided.
19	CA 5.8.2	Ghosh S. et al.	2020	Cardiogenic shock with first-degree heart block in a patient with glyphosate-surfactant poisoning.	Tropical doctor (2020): Ahead of print. 10.1177/0049475520971594	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper is a case report that describes the case of a 34-year-old man who developed corrosive injury to his GI tract after ingesting 200 mL of formulated glyphosate. He went on to develop hypotension and transient multiorgan failure including myocardial dysfunction which improved with intensive supportive care. This sequence of events is not unexpected in large ingestions of formulated glyphosate.

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20	CA 5.8.2	Hao J. Y. et al.	2020	Glyphosate-induced Delayed Pyloric Obstruction, Ulcer and Scar Changes.	Journal of the College of Physicians and Surgeons-Pakistan (2020), Vol. 30, No. 8, pp. 868-870	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper describes a case report of a 44-year-old woman who presented with pyloric obstruction two months after accidentally ingesting 100 mL of formulated glyphosate. After the initial ingestion, her family took her to the hospital where the patient was treated for 13 days and then discharged. She later returned to the hospital with recurrent nausea & vomiting, underwent endoscopy where they discovered scarring and pyloric obstruction. The patient underwent a partial gastrectomy and gastrojejunostomy with improvement of symptoms. This clinical course of events is not unexpected in significant ingestions of formulated glyphosate as these ingestions are corrosive and can cause scarring & gastric outlet obstruction.
21	CA 5.8.2	Kimura T. et al.	2020	Renal tubular injury by glyphosate-based herbicide.	Clinical and experimental nephrology (2020), Vol. 24, No. 12, pp. 1186	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This is a case report with an image showing proximal tubular epithelial injury in a 78-year-old woman who ingested formulated glyphosate in a suicide attempt. This ingestion resulted in transient renal failure which improved with hemodialysis. This in not unexpected in large suicidal ingestions.
22	CA 5.8.2	Nayak S. et al.	2020	Deliberate self-poisoning in south odisha: study of its clinical profile and outcome.	Asian Journal of Pharmaceutical and Clinical Research (2020), Vol. 13, No. 8, pp. 169-173	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper aimed to characterize the nature of self-poisoning in the Odisha region of India. Over a 2-year period they evaluated 200 patients who presented to the Maharaja Krishna Medical College and found that 149 (74.5%) patients had ingested pesticides. 10 patients ingested glyphosate. 9 developed nausea & vomiting, 2 developed corrosive injury to their GI tracts, 2 had pneumonitis likely due to aspiration, 2 developed hypotension, 2 had altered mental status, 2 developed dysrhythmias, 3 had dysphagia, 3 had dehydration & 2 died. There was certainly overlap in the clinical picture as there are more symptoms described than patients. The symptoms described are not unexpected as large ingestions of formulated glyphosate causes corrosive injury to the GI tract and subsequent hypotension & multiorgan failure.
23	CA 5.8.2	Ren Y. et al.	2020	Case report of pyloric obstruction caused by glyphosate herbicides.	Acta Medica Mediterranea (2020), Vol. 36, No. 6, pp. 3485-3488	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper is a case series describing 3 patients with formulated glyphosate ingestions. The authors describe pyloric obstruction and laryngeal scarring in the patients. Formulated glyphosate is caustic to the GI tract and airways so this clinical scenario is not unexpected.
24	CA 5.8.2	Shin J. et al.	2020	Severe chemical burns related to dermal exposure to herbicide containing glyphosate and glufosinate with surfactant in Korea.	Annals of occupational and environmental medicine (2020), Vol. 32, Art. No. e28	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This article is a case report detailing an injury sustained by a farmer who was reportedly spraying a glyphosate/glufosinate herbicide formulation, spilled the contents of his back pack on his right shoulder & hip, did not wash the formulation off and presented 3 days after with rapidly progressive necrotizing wounds that have a necrotizing fasciitis appearance in the photos. Unfortunately,

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						the patient succumbed to his injuries. These herbicides are not corrosive to the skin in this fashion, it is impossible to tell what the farmer was exposed to in this scenario as infectious processes can result in a very similar clinical appearance. This is completely atypical and should not be associated with glyphosate exposure.
25	CA 5.8.2	Stajnko A. et al.	2020	Seasonal glyphosate and AMPA levels in urine of children and adolescents living in rural regions of Northeastern Slovenia.	Environment international (2020), Vol. 143, Art. No. 105985	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper aimed to measure glyphosate and AMPA exposure in children & adolescents in Slovenian agricultural areas. They measured 1st morning urines in the 246 participants in the winter and again in 225 participants in the summer. They addressed the fact that the detection of AMPA could come from other detergent exposures and not from glyphosate alone. 221 blood samples were also drawn in the first sampling period. They detected glyphosate in 27% of the urine samples from the winter and 22% in the summer. Their data demonstrate much lower glyphosate concentrations than reported in other parts of the world. A large percentage of the children had concentrations less than the LOQ with 72% of the younger children & 74% of the older children testing below the LOQ in the first sampling period, and 79% of the younger & 76 % of the older testing below the LOQ in the 2nd period. The estimated systemic dose of glyphosate was 0.003 mcg/kg of body weight – significantly below the ADI of 0.1 mg/kg of body weight. This article supports the evidence that glyphosate exposures tend to be very low and don't pose a health risk.
26	CA 5.8.2	Xiao L. et al.	2021	A 9-year retrospective study of poisoning-related deaths in Southwest China (Sichuan).	Forensic Science International (2021): Ahead of Print 10.1016/j.forsciint.2020.110558	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper describes retrospective study evaluating 782 poisoning deaths in Sichuan Province, China. The deaths were characterized as accidental, suicidal or homicidal. Pesticide ingestion was responsible for 40% of deaths. Only 2 deaths were related to glyphosate formulations and no details were given about the cases.
27	CA 5.8.3	Abdel-Halim K. Y. et al.	2020	Cytotoxicity and Oxidative Stress Responses of Imidacloprid and Glyphosate in Human Prostate Epithelial WPM-Y.1 Cell Line.	Journal of Toxicology (2020), Vol. 2020, Art. No. 4364650	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on cytotoxicity of glyphosate on prostate cells that does not alter risk assessment. The ability of glyphosate to induce in vitro cytotoxic and oxidative stress on normal human cells (prostate epithelial WPM-Y.1 cell line) was evaluated with the methyl tetrazolium test (MTT) and histopathological investigation. Cell viability was evaluated with an MTT test for 24 h. The median inhibition concentration (IC50) value was 0.025 mM for glyphosate. At low concentrations (mM), the examined pesticides significantly reduced cell viability and caused cell death. Coupling of cell viability, oxidative stress, and histopathological alterations provides good tools to assess the cytotoxicity of pesticides in vitro at low concentrations. Moreover, the abnormal damage of cell structure is considered an important signal of organ dysfunction. Metabolic activation system was not clearly and completely described. No HCD and no positive or negative control were reported.

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28	CA 5.8.3	Ben Maamar M. et al.	2020	Epigenome-wide association study for glyphosate induced transgenerational sperm DNA methylation and histone retention epigenetic biomarkers for disease.	Epigenetics (2020): Ahead of print. 10.1080/15592294.2020.1853319	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides only supplementary information on epigenetic effects of glyphosate and does not alter risk assessment. The current study was designed to identify epigenetic biomarkers for glyphosate-induced transgenerational diseases using an epigenome-wide association study (EWAS). Following transient glyphosate exposure of gestating female rats (F0 generation), during the developmental period of gonadal sex determination, the subsequent transgenerational F3 generation, with no direct exposure, were aged to 1 year and animals with specific pathologies identified. The pathologies investigated included prostate disease, kidney disease, obesity, and presence of multiple disease. The sperm were collected from the glyphosate lineage males with only an individual disease and used to identify specific differential DNA methylation regions (DMRs) and the differential histone retention sites (DHRs) associated with that pathology. Unique signatures of DMRs and DHRs for each pathology were identified for the specific diseases. However, a comparison of DMRs and DHRs of the glyphosate treated animals versus the control animals was not performed. It is not clear what has been actually tested. Test conditions are not clearly and completely described. Only one dose level was reported / no dose-response relationship. Number of animals used per dose level not reported. Method of analysis was not described for analysis test media (no validation, no verifications). Furthermore, no HCD reported, and no positive controls.
29	CA 5.8.3	Diers S. et al.	2020	Does glyphosate affect the in vitro maturation and further development of bovine oocytes? Original Title: Beeinflusst Glyphosat die In-vitro-Maturation und weitere Entwicklung boviner Oozyten?	Zuechtungskunde (2020), Vol. 92, No. 4, pp. 223-235	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on endocrine disruption, but not altering risk assessment. It is difficult to be interpreted because no HCD and no positive controls were used. The data requirement for endocrine disruption is not met, since neither mode of action nor ED properties are sufficiently shown due to no dose-response relationship for gene induction. In addition, the product used in the study is not sufficiently identified, the test substance was identified only as 'Roundup'. The surfactant system in the formulated product used in this study was not confirmed by the author. It is therefore not possible to confirm whether the product used, is the representative glyphosate formulation MON 52276 relevant for the glyphosate EU renewal and whether the product contained POEA or not.
30	CA 5.8.3	Ganesan S. et al.	2020	Ovarian mitochondrial and oxidative stress proteins are altered by glyphosate exposure in mice.	Toxicology and applied pharmacology (2020), Vol. 402, Art. No. 115116	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This publication does not alter risk assessment negatively, since no (major) effects were found with any of the tested read outs. However, it could be used - with restrictions - as supporting evidence for lack of any effects of test item on liver, heart, spleen, kidney or uterine weight, AKT or gamma-H2AX protein abundance, or the ovarian level of steroidogenic proteins, or on estrous cyclicity and circulating E2 or P4. The study was performed following scientifically acceptable standards. However, reliability is given with restrictions since details on test item (e.g. purity), historical control data, positive controls and analysis of test media are missing.

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31	CA 5.8.3	Ingaramo P. et al.	2020	Are glyphosate and glyphosate-based herbicides endocrine disruptors that alter female fertility?	Molecular and cellular endocrinology (2020), Vol. 518, Art. No. 110934	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The review article selectively reports results of in vitro and in vivo studies suggesting endocrine disrupting properties of glyphosate and glyphosate-based herbicides at low or "environmentally relevant" dose levels in the female reproductive tissue. Most of the studies focused on the endocrine-disrupting effects of glyphosate in endocrine-dependent tissues (ovary and uterus). The authors claim that most of these studies show effects at very low concentrations, which would be undetected in traditional toxicology studies. However, they did not adequately explain the design of the experiments, address potential confounders in the cited studies (e.g., overt and systemic toxicity, cytotoxicity) that impact the studies validity to inform an endocrine assessment, nor the reasons why the reported investigations can detect effects that the comprehensive database of regulatory toxicity studies for glyphosate were not able to ascertain. The most significant flaw with this review was the omission of numerous reliable and relevant published in vitro and in vivo studies, and publicly available regulatory assessments, that are critical to inform a weight of evidence assessment for glyphosate and GBHs. The missing information was largely included in the recent 2017 EFSA Glyphosate ED weight of evidence evaluation where it was concluded that glyphosate is not an endocrine disruptor. Figure 1 proposes mechanisms of endocrine disruption that include impact on aromatase activity, estrogenic effects through a ligand-independent mechanism, cell proliferation, and expression of oestrogen-dependent proteins. It was concluded in the recent 2015 USEPA and 2017 EFSA weight of evidence ED assessments that glyphosate does not impact steroidogenesis including aromatase activity. Findings in the articles cited in figure 1 for aromatase activity are confounded by non-specific effects of supraphysiological concentrations of the surfactant in these formulations in in vitro or in vivo systems. There is no evidence of glyphosate impacting aromatase expression or activity by assessing apical endpoints in the comprehensive toxicology database for glyphosate (for review see Levine et al. 2020). Figure 1 also purports that glyphosate is a ligand for the oestrogen receptor. It has been well established that glyphosate in not a ligand for the oestrogen receptor and does not transactivate the oestrogen responsive genes endpoints (for a comprehensive review of the oestrogen pathway see Levine et al. 2020). The paper cited in figure 1 to support a ligand-independent mechanism by Mesnage et al. 2017 was reported to only occur at the unrealistic exposure concentration of 20,000 mg glyphosate a.e./L (118 µm) and by activating protein kinase A that increases the phosphorylation and activation of the oestrogen receptor. Mesnage et al. did not provide evidence in their paper that the phosphorylation status of the oestrogen receptor was changed to support their hypothesis nor is this hypothesis consistent with the weight of evidence from validate functional assays. Figure 1 also proposes that glyphosate can cause cell proliferation through and endocrine mechanism. This hypothesis is inconsistent

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						with results of the comprehensive database of glyphosate toxicology studies. The key citation that support this hypothesis is by Thongprakaisang et al. 2013. Mesnage et al. 2017 concluded the results in Thongprakaisang et al. 2013 likely result from contamination and not glyphosate. An earlier study that reported modest proliferation by glyphosate only occurred at the extremely high concentration of 1000 µM and the authors concluded that the modest proliferation observed in their study resulted from a non-endocrine mechanism (Lin and Garry, 2000). The final endocrine mechanism described in figure 1 refers to expression of oestrogen-dependent proteins. The significance of these findings is questionable based on the results of the endocrine screening battery reviewed by EFSA in 2017 and the comprehensive regulatory toxicology database for glyphosate. The authors, however, recognize that it was not possible to reproduce in vivo most of the effects of glyphosate and/or GBHs observed in vitro. They claim this could be due that the species tested are not the appropriate ones and claimed that the sheep constitute a highly appropriate model to evaluate the effects of EDCs due to the similarity between sheep and humans, especially regarding gestational and thyroid physiologies and brain ontogeny. However, robust data supporting this assumption are limited.
32	CA 5.8.3	Levine S. L. et al.	2020	Review and analysis of the potential for glyphosate to interact with the estrogen, androgen and thyroid pathways. Special Issue: Glyphosate exposure and toxicology.	Pest Management Science (2020), Vol. 76, No. 9, pp. 2886-2906	The article has been classified as relevant by full text - Category B for the following reason: The article is a review article providing a good summary and also further analysis on possible endocrine disrupting properties of glyphosate in USEPAs endocrine disruptor screening program (EDSP) and further literature but does not alter risk assessment.
33	CA 5.8.3	Munoz J. P. et al.	2020	Glyphosate and the key characteristics of an endocrine disruptor: A review.	Chemosphere (2020): Ahead of print. doi.org/10.1016/j.chemosphere.2020.128619	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. Munoz et al. based on the ten key characteristics (KC) of Endocrine Disrupting Chemicals (EDCs) recently proposed (La Merrill et al., 2020) reviewed a selective set of publications related to glyphosate as a possible endocrine disruptor. The authors claim that glyphosate exhibited eight of the ten KCs of an EDC. This checklist of KC was not created in conjunction with nor is it recognised by any regulatory agency as a replacement for established weight of evidence approaches used by regulatory agencies to assess whether a compound is an endocrine disruptor. The authors did not perform a systematic review for glyphosate of the publicly available information resulting in a significant flaw with this publication, the omission of numerous reliable and relevant published in vitro and in vivo studies, and publicly available regulatory assessments, that are critical to inform a weight of evidence assessment for glyphosate. Glyphosate has undergone extensive regulatory testing and assessment to evaluate its potential to be an endocrine disruptor. In 2015 the US EPA released its weight of evidence evaluation of glyphosate and more recently the European Food Safety Authority in 2017, who

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						independently performed an endocrine assessment as part the of the glyphosate renewal process. Both agencies concluded based on the US EPA EDSP battery and all other scientifically relevant information that glyphosate does not interact with the oestrogen, androgen thyroid and steroidogenic pathways and concluded that glyphosate is not an endocrine disruptor. Furthermore, the cited studies in Munoz et al. 2020 were not critically evaluated for relevance and reliability nor evaluated with a weight of evidence to conclude whether the criteria for each key characteristic was met. The authors state "*Here, we conduct a comprehensive review where we describe the most important findings of the glyphosate effects in the endocrine system and assess the mechanistic evidence to classify it as and EDC*". However, many of the studies the authors cite as evidence for glyphosate meeting one of the KC they used studies that were conducted with a glyphosate-based formulation only. The authors generally focused on a small subset of papers that used non-standard in vitro methods that tested glyphosate-based formulations at unrealistically high levels and in vivo studies that don't follow international guidelines. These papers inflate the relevance of findings derived from their in vitro models to the in vivo situation and invariably fail to discuss or recognize confounding effects of the formulation. As a result, these papers are not considered to be reliable for an endocrine assessment.
34	CA 5.8.3	Toth G. et al.	2020	Cytotoxicity and hormonal activity of glyphosate-based herbicides.	Environmental pollution (2020), Vol. 265, No. Pt B, Art. No. 115027	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This article provides only supplementary information for risk assessment, since the in vitro experiments were performed with yeast instead of human cells. Nevertheless, the findings showed, that neither glyphosate nor AMPA impaired estrogenic or androgenic activity in the test system. Purity and storage conditions of test items and historical control data not reported. Positive controls applied, but data not shown. This study claims that POEA and some glyphosate-based formulations are estrogenic and/or androgenic. However, the study does not provide reliable information that POEA or any of the tested formulations are estrogenic and/or androgenic. The results claiming estrogenicity and/or androgenicity of the formulations are not in agreement with what would be predicted based on chemical structures of the surfactants and are apparently confounded by cytotoxicity based on responses presented within the paper. Because of the surface-active properties (i.e. surfactant properties) of POEA and other surfactants, it is very difficult to generate interpretable results from in vitro or cell-based assays, like the yeast assay, with surfactants. Rather, conclusions of estrogenicity and androgenicity should be based on in vivo studies. Even if the activity levels claiming estrogenic or androgenic activity are taken at face value, their potency for the estrogen and androgen receptors is so low these responses are not considered biologically relevant and realistic exposures to these substances are far below reported effect levels in the paper.
35	CA 5.8.3	Zhang C. et al.	2020	Molecular Basis for Endocrine Disruption by	International journal of environmental research and	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides only supplementary

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				Pesticides Targeting Aromatase and Estrogen Receptor.	public health (2020), Vol. 17, No. 16, Art. No. 5664	information on in vitro data and binding information gained by in silico models but not altering risk assessment. Limited information on test material (batch, analytical purity) provided. Historical control data were not included. The reported inhibition of aromatase activity (up to 30% at 100 µM glyphosate acid) is likely related to using ethanol or DMSO as a solvent for glyphosate, rather than water or buffer. Glyphosate is not soluble in an organic solvent, like ethanol or DMSO, and this likely confounded the results of the assay because glyphosate was not fully solubilized. Zhang et al. used recombinant CYP19 at low protein levels in the assay and did not add a "buffering protein" like BSA, which made the aromatase enzyme, and its associated reductase, susceptible to denaturization. Consistent with denaturing the aromatase enzyme, the slope of the inhibition curve was extremely shallow, uncharacteristic of aromatase inhibition, and likely reflects confounding effects of undissolved test substance. In the USEPA's test guideline for aromatase activity, activity of < 25% is considered negative and activity between 25% and < 50% is considered equivocal. Greater than 50% inhibition must be estimated for a substance to be considered positive in EPA's guideline study.
36	CA 5.8.3	Zhang J. et al.	2021	Melatonin alleviates the deterioration of oocytes and hormonal disorders from mice subjected to glyphosate.	Molecular and cellular endocrinology (2021), Vol. 520, Art. No. 111073	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The publication investigates whether melatonin can improve reproductive defects caused by glyphosate. No new information on glyphosate toxicity is provided and the article does not alter risk assessment. There is a limited information on test material provided (no information on source, batch or purity), limited information on test animals (no information on housing, environmental conditions or weight), no historical control data provided.
37	CA 5.8.3	Fu H. et al.	2020	Effects of glyphosate-based herbicide-contaminated diets on reproductive organ toxicity and hypothalamic-pituitary-ovarian axis hormones in weaned piglets.	Environmental pollution (2020): Ahead of print. doi.org/10.1016/j.envpol.2020.115596	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article is not reliable for the following reason: The study did not follow any OECD guideline and was not performed under GLP conditions. No analytical verifications of the test item in the diet were performed. In addition, there was no information on food consumption reported, therefore the actual intake of glyphosate by the animals remains unclear. The piglet tested in the study is an animal species that is not routinely used to investigate reproductive performances. The authors did not provide information on the sexual maturation in the tested strain which would have helped in the interpretation of parameters like the hormone levels and histopathology of the uterus and in the ovaries. Overall, for piglets that have been used in the recent years for investigation on potential effects on reproductive toxicity induced by a xenobiotic, it has been reported that in sexually immature animals a reliable histopathological and functional evaluation of possible test item–related effects on the female reproductive organs is not possible (1-4). In this study hormonal analyses has been performed only once at sacrifice when for reliable interpretation of the data, hormonal analysis should have been taken more times on the same animal (ideally before the treatment) and the time of sampling should be recorded. Therefore, the reliability of the hormonal data in this study is also

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						questionable. In conclusion, the study presents many deficiencies and does not meet the basic scientific principles for this type of investigation and is it considered not to be reliable.
38	CA 5.8.3, CP 7.1.7	Spinaci M. et al.	2020	Glyphosate and its formulation Roundup impair pig oocyte maturation.	Scientific reports (2020), Vol. 10, No. 1, Art. No. 12007	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on maturation, steroidogenesis and oxidative stress markers of cumulus-oocyte complexes (COCs) from pigs, but not altering risk assessment. In addition, effects were mainly found at unphysiologically high doses (> 1 mM). The purity and storage conditions of the test item were not reported. No cytotoxicity testing performed, no positive and truly negative controls performed and also no historical control data provided. No metabolic activation system applied.
39	CA 6.10.1	de Souza Ferreira; A. P. et al.	2020	Glyphosate and aminomethylphosphonic acid (AMPA) residues in Brazilian honey.	Food Additives & Contaminants, Part B: Surveillance (2020): Ahead of Print doi.org/10.1080/19393210.2020.1855676	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Glyphosate residues were found in Brazilian honey (HR = 0.22 mg/kg). An AMPA residue of 0.1 mg/kg was detected in one sample. The residue levels found in the analysed samples are not directly relevant to the EU uses supported in the AIR dossier. However, the data may be useful to interpret the results of the EU monitoring data for glyphosate residues in honey. Therefore, they are considered as category B (supplementary information). The publication is reliable in most points, however origin of samples is not described in full detail.
40	CA 6.10.1	Panseri S. et al.	2020	Pesticides and Environmental Contaminants in Organic Honeys According to Their Different Productive Areas toward Food Safety Protection.	Foods (2020), Vol. 9, No. 12	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Monitoring data from organic honey samples (n = 98) collected in Italy (Apulia) during 2019-2020. Residues of glyphosate, AMPA and glufosinate were not found in any sample. References are provided to validation of analytical methods. Source of honey samples are not exactly described.
41	CA 6.10.1	Petcu C. D. et al.	2020	Study regarding the honey contamination degree assessed in a specialized production unit.	Scientific Papers, Series D. Animal Science (2020), Vol. 63, No. 1, pp. 442-449	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Samples from "honey sourced from beekeepers from the centre and Southern Romania (in order to form a large and homogeneous batch)" were analysed. Analysis done by LC-MS/MS with poor method description and no validation data. Residues of glyphosate were below the limit of quantification (<0.01 mg/kg) in 15 acacia and 15 polyfloral honey samples.
42	CA 6.10.1	Yaqub G. et al.	2020	Monitoring and risk assessment due to presence of metals and pesticides residues in honey samples from the major honey producing forest belts and different brands.	Food Science and Technology (2020), Vol. 40, No. Suppl. 1, pp. 331-335	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: 25 samples of different national (Pakistan) and international honey brands were collected for analysis of residues of heavy metals and pesticides. Glyphosate residues were detected in 5 samples in a range of 0.44 - 3.5 mg/kg (ppm). The residue levels found in the analysed samples are not directly relevant to the EU uses supported in the AIR dossier. However, the data may be useful to interpret the results of the EU monitoring data for glyphosate residues in honey. Therefore, they are considered as category B (supplementary information). The publication is reliable, but with several restrictions, i.e. missing validation data, analytical method and origin of samples

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						are not sufficiently described.
43	CA 6.3	Gomez-Ramos M. d. M. et al.	2020	Pesticide residues evaluation of organic crops. A critical appraisal.	Food Chemistry: X 5 (2020), Art. No. 100079	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Analytical method development and optimisation for detection of multiple pesticides in crops with low LOQ. Monitoring data from 136 commercial organic samples showed no residues of glyphosate, n-acetyl glyphosate, AMPA, n-acetyl-AMPA. Origin of samples not fully described. For method validation it is relied on published data.
44	CA 6.3	Khan N. et al.	2020	Assessment of Health Risk due to Pesticide Residues in Fruits, Vegetables, Soil, and Water.	Journal of Chemistry (2020), Vol. 2020, Art. No. 5497952	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, does not alter risk assessment. Fruit, vegetable, soil and water samples from Pakistan were analysed for glyphosate residues (monitoring), with detects in fruits and vegetables. Missing validation data, analytical method and origin of samples not sufficiently described.
45	CA 6.3	Lozowicka B. et al.	2019	Pesticide residues in seeds of winter oilseed rape (Brassica napus L.).	Progress in Plant Protection (2019), Vol. 59, No. 4, pp. 199-205	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Monitoring data from OSR samples collected in Poland during 2016-2019. Glyphosate residues found in 14% of samples (max 0.27 mg/kg). Analytical method not fully described, origin of samples not fully described.
46	CA 6.5.3	Tittlemier S. A. et al.	2020	Fate of glyphosate in wheat during milling and bread production.	Cereal Chemistry (2020): Ahead of Print DOI: 10.1002/cche.10369	The article has been classified relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only. No endpoint is derived. The study does not alter risk assessment. This study is considered supportive for processing of wheat, however no clear processing factors can be derived. Absence of validation data in different processed wheat matrices. For the analytical method it is referred to another publication (Tittlemier et al., 2017).
47	CA 6.9	Solomon K. R.	2020	Estimated exposure to glyphosate in humans via environmental, occupational, and dietary pathways: an updated review of the scientific literature. Special Issue: Glyphosate exposure and toxicology.	Pest Management Science (2020), Vol. 76, No. 9, pp. 2878-2885	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: The article provides only supplemental information, which does not alter risk assessment. No endpoint was derived. Extended risk assessment using published exposure data for air, water, bystanders, the general public, domesticated animals, pets, and applicators. Based on this large dataset, no risk to any exposure pathway/group was identified. The article is reliable with respect to risk assessment methodologies applied, i.e. well described methodologies and data set for analysis.
6	CA 7.1.3, CA 7.1.1.2	Tauchnitz N. et al.	2020	Assessment of pesticide inputs into surface waters by agricultural and urban sources - A case study in the Querne/Weida catchment, central Germany.	Environmental pollution (2020), Vol. 267, Art. No. 115186	The article describes pesticide analyses, amongst them glyphosate, in surface waters and in soil samples within a German catchment area (CA 7.5). Additionally, batch adsorption (CA 7.1.3) and anaerobic soil degradation experiments (CA 7.1.1.2) were conducted. For CA 7.5, the article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for CA 7.5 is provided. Please refer to Tables 32 and 33 above. For CA 7.1.1.2 and CA 7.1.2, see below.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability** for CA 7.1.1.2 and CA 7.1.3 for the following reason: CA 7.1.1.2: For the anaerobic degradation experiment, the methods are well described, however the experimental design is not in agreement with the relevant guideline (OECD 307), e.g. due to use of synthetic rainwater, insufficient information on the test concentrations, use of slurry of a liquid-solid ratio of 0.3:1, air-tight incubation and analysis of pore water, only. From the information provided, it cannot be concluded on the representativeness of the soils used. Further, besides the final half-live, no detailed results are reported. Thus, no conclusion can be made on the quality of the results. The results from the anaerobic degradation experiment are therefore considered **not reliable**. CA 7.1.3: For the batch adsorption experiment, the methods are well described, however the experimental design is not in agreement with the relevant guideline (OECD 106), e.g. due to use of synthetic rainwater instead of CaCl2 solution, insufficient information on the test concentrations and a temperature of 10 °C. From the information provided, it cannot be concluded on the representativeness of the soils used. Further, besides the final adsorption parameters, no detailed results are reported. Thus, no conclusion can be made on the quality of the results. The adsorption results are therefore considered **not reliable**.
48	CA 8.1.4, CP 10.1.3	Cuzziol Boccioni A. P. et al.	2020	Toxicity assessment at different experimental scenarios with glyphosate, chlorpyrifos and antibiotics in Rhinella arenarum (Anura: Bufonidae) tadpoles.	Chemosphere (2020), Art. No. 128475, Ahead of print. doi.org/10.1016/j.chemosphere.2020.128475	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not alter risk assessment but the findings of the work could serve to discuss the sublethal effects (biological, morphological and enzymatic parameters) of two different glyphosate concentrations (1.25 and 2.5 mg/L) to tadpoles of an amphibian species as part of a broader weight of evidence. An endpoint cannot be derived. No analytical verifications of the test item concentrations are provided. Surface egg strings of R. arenarum used for the experiments were collected from temporary small ponds situated in the natural floodplain of the Parana River, considered as an unpolluted site (no analytical verification was however made). Only two concentrations were tested.
49	CA 8.2.4.2, CP 10.2.1	Asnicar D. et al.	2020	Effects of Glyphosate-Based and Derived Products on Sea Urchin Larval Development.	JOURNAL OF MARINE SCIENCE AND ENGINEERING (2020), Vol. 8, No. 9, Art. No. 661	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: Provides information on the effects of glyphosate, AMPA and Roundup on the larval development of sea urchins but no risk assessment relevant endpoints are given. The study does not alter risk assessment. The purity of glyphosate and AMPA are not provided. The urchins were collected from the open environment and could have been exposed previously to pesticides. The experimental conditions are inadequately described (it is unclear if oxygen saturation > 80% applies to all treatment or just for respiration rate treatment). Light conditions are not reported. No validation data or analytical verifications are provided. No Ecx assessment was conducted.
50	CA 8.2.6.1, CA 8.2.7,	Tajnaiova L. et al.	2020	Determination of the Ecotoxicity of Herbicides	Plants-Basel (2020), Vol. 9, No. 9, Article No. 1203	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This study investigates the effect of

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
	CP 10.2.1			Roundup (R) Classic Pro and Garlon New in Aquatic and Terrestrial Environments.		Roundup® Classic Pro (not relevant for the AIR5, as it contains the additive surfactant ether alkylamine ethoxylate) and AMPA on the aquatic organisms duckweed Lemna minor and green algae Desmodesmus subspicatus and on the enzymatic activity of soil. The endpoints for AMPA do not alter risk assessment but are supportive of low exposure risk (relevant growth inhibition endpoints obtained for both green algae and macrophytes: Desmodesmus subspicatus (green alga): 72 h AMPA IC50 = 117.8 mg/L; 72 h AMPA IC50 with pH adjusted solution = 192.1 mg/L). No analytical verifications of the test item concentrations in the medium were conducted. The experimental design was carried out according to the following standards: EN ISO 8692 (Water Quality-Fresh Water Algal Growth Inhibition Test with Unicellular Green Algae (ISO 8692:2012)) and EN ISO 20079 (Water Quality-Determination of the Toxic Effect of Water Constituents and Waste Water on Duckweed (Lemna minor)-Duckweed Growth Inhibition Test (ISO 20079:2005)). Only the IC50 assessment was performed. There is no analytical to confirm exposure. Results are also ambiguous in that % inhibition plots are presented but data presented is unknown (rate or biomass or cell density?).
51	CA 8.3.1.1.2, CA 8.3.1.4, CP 10.3.1.1.2, CP 10.3.1.4, CP 10.3.1.6	Motta E. V. S. et al.	2020	Oral or Topical Exposure to Glyphosate in Herbicide Formulation Impacts the Gut Microbiota and Survival Rates of Honey Bees.	Applied and environmental microbiology (2020), Vol. 86, No. 18	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: No proper endpoints are provided (only acute toxicity at 24h). The study does not alter risk assessment, but the findings of the work could serve to support the acute contact toxicity to bees and further sub-lethal effects of glyphosate (mortality) on honey bees as part of a broader discussion. Both laboratory and field experiments were conducted. The study is focused on the effects of glyphosate on bee gut microbiota. The glyphosate standard tested item is not fully described. No analytical verifications of the test item concentrations in the medium were conducted. Study is not compliant with any accepted guideline and therefore validity criteria cannot be assessed. Glyphosate was tested topically at different concentrations and only EC50 assessment (at 24 h instead of at 48 h as recommended by the guidance) was performed. A dose-response effect was observed in several parameters studied (not only mortality). For the field experiments, there is no security that the bees haven't been exposed to pesticides before the tests started. Findings cannot be related directly to impacts at the population level therefore influence on direct level and indirect assessment is uncertain. Nor is this a study type driven by data requirements. In additon, the tested formulation is not related to the representative formulation for the AIR5 (MON 52276).
52	CA 8.3.1.2, CP 10.3.1.2	Almasri H. et al.	2020	Mixtures of an insecticide, a fungicide and a herbicide induce high toxicities and systemic physiological disturbances in winter Apis mellifera honey bees.	Ecotoxicology and environmental safety (2020), Vol. 203, Art. No. 111013	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Provides information on the effects of glyphosate on the survival of honey bees (at 3 different concentrations after 20 days continuous oral exposure) but no risk assessment relevant endpoints are given. The study does not alter risk assessment. Individual daily food consumption was not provided (it was calculated by dividing the food consumed per cage by the number of bees that remained alive each day in each cage. The

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						same as suggested by the OECD TG 245). No ECx assessment was conducted. The pesticide concentrations in the sugar solution were checked by GC-MS/MS but values were not reported in article. The test is not performed according to the OECD TG 245 chronic oral toxicity test (longer exposure) and therefore it is not possible to properly assess validity criteria (control mortality after 10 days). Whilst the study presents survival data, the test was conducted as an extended laboratory based study with a 20 day duration. This does not reflect an accepted test design used for Annex I renewal purposes. Despite 14 cages of 30 bees being for each exposure regimen, (cage design is not described), there are no standard error bars presented for the replication so the relevance of the proposed survival lines cannot be established from Figure 1, where survival in the glyphosate only groups, appears to be in the 80-90% up until day 12-15 and then at this point there appears also to be an effect in the control with survival dropping off sharply. A further point is that there is no positive control group for the DMSO used to enable dispersal of the substances. The influence of this on the overall toxicity is uncertain. Despite what appears to be a reliable test, there are some shortcomings in the test design.
53	CA 8.3.1.2, CP 10.3.1.2	Strobl V. et al.	2020	Positive Correlation between Pesticide Consumption and Longevity in Solitary Bees: Are We Overlooking Fitness Trade-Offs?	Insects (2020), Vol. 11, No. 11, Art. No. 819	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Provides information on the survival of solitary bees after chronic exposure to glyphosate (at 1 single concentrations after 10 days continuous oral exposure) but no risk assessment relevant endpoints are given. The study does not alter exisiting risk assessment. Although the Osmia bicornis tested adults were obtained from cocoons reared in the laboratory, original individuals were transferred from organic orchards in Germany and previous pesticide exposure cannot be totally excluded. Measured parameters are not clearly described and there seems to be an error/typo in the glyphosate dose at which the bees were exposed. Sucrose solution consumption was recorded but no analytical verifications of the test item concentrations in the medium were conducted. No guidance document is available yet for lab studies with solitary bees. No ECx assessment was conducted for any of the parameters studied.
54	CA 8.3.1.4, CP 10.3.1.4	Delkash-Roudsari S. et al.	2020	Assessment of lethal and sublethal effects of imidacloprid, ethion, and glyphosate on aversive conditioning, motility, and lifespan in honey bees (Apis mellifera L.).	Ecotoxicology and environmental safety (2020), Vol. 204, Art. No. 111108	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: No endpoints are provided, the study does not alter risk assessment but the findings of the work could serve to support the (low) chronic toxicity of glyphosate (sublethal effects) to honey bees as part of a broader discussion. The source of the test individuals is not clearly reported and the lack of a previous pesticide exposure cannot be excluded. The duration of the chronic study is not clear (bee lifespan) and there is no indication about the days the bees were exposed to the tested concentrations. Chronic dose metrics per bee cannot be precisely quantified. No analytical verifications of the test item concentrations in the chronic oral test were conducted. The test designs for the discrimination task and the rhythm, nicity monitoring are not recognisable for consideration at the EU level. In addition to glyphosate, RoundUp® Ready-to-Use Weed and Grass Killer were tested that cannot be related to the representative formulation for the glyphosate EU renewal (the representative formulation is

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						MON 52276).
55	CA 8.3.2, CP 10.3.2.2	Lacava M. et al.	2021	The pest-specific effects of glyphosate on functional response of a wolf spider.	Chemosphere (2021), Vol. 262, Art. No. 127785	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: No endpoints are provided, the study does not alter risk assessment but the findings of the work could serve to support the sub-lethal effects (on the feeding rate) of glyphosate on a ground-dwelling spider as part of a broader discussion. The test substance was identified only as 'Roundup'. The surfactant system in the formulated product used in this study was not confirmed by the author. It is therefore not possible to confirm whether the product used contained POEA or not. The tested individuals were collected from native forests from Uruguay and previous pesticide exposure cannot be excluded. The tested substance has not been fully identified. A tested rate is not provided (just that a glyphosate solution with a concentration of 280 mg/L a.i. was used). Tested individuals were exposed by contact for only 30 minutes. The experiment run in glass containers only for 4 hours, so only acute effects were assessed. Only one concentration was tested. The outcome of the study not only depends on the effects of glyphosate, but also on the tested prey (different results depending on the prey). The test is not conducted according to any guidance and therefore, it is not possible to confirm whether the study meets any validity criteria.
56	CA 8.3.2.2, CP 10.3.2.2	Sekrecka M.	2019	Influence of pesticides and bioregulators on the number of predatory mite Typhlodromus pyri (Phytoseiidae). Original title: Wplyw srodkow ochrony roslin oraz bioregulatorow na liczebnosc drapieznego roztocza dobroczynka gruszowca Typhlodromus pyri (Phytoseiidae).	Zeszyty Naukowe Instytutu Ogrodnictwa (2019), Vol. 27, pp. 41-52	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides information on the mortality of T. pyri mites 7 days after exposure but no risk assessment relevant endpoint can be obtained from the study. The study does not alter risk assessment. The test item is not fully described. The tested dose in g a.s./ha is not clear. Source of the tested individuals not fully reported (conditions of the lab mass rearing). The test design and the developmental phase of the tested individuals are not relatable to EU risk assessment (apple slices sprayed using a potter tower and then after drying, animals introduced). No agreed guidance has been followed (Bluemel et al., 2000).
57	CA 8.4.2, CP 10.4.2	Alhewairini S. S.	2020	Toxicity effects of glyphosate and metribuzin on five species of soil-dwelling predatory mites.	Pakistan Journal of Agricultural Sciences (2020), Vol. 57, No. 5, pp. 1429-1435	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: Provides information on the effects of glyphosate on the mortality of 5 soil-dwelling mite species, but other than that recommended in EU Reg. 283/2013 (Data requirements for AS). No relevant endpoints for the risk assessment are given. The study does not alter risk assessment. No real dose was provided: 1.1 L (glypho-48 or glyphosate as AS)/100L water, but it is unclear how many L of solution applied per ha? Individuals collected in the field with no information about those sites and previous exposures to pesticides. No clear information about maintainance of the mites previous to treatments in the laboratory. The experimental conditions (temperature and soil) are inadequately described and no validation data or analytical verifications are provided. No ECx assessment was conducted. The test is not performed according to any OECD guideline.
58	CA 8.6.2,	Fernandes	2020	Ecotoxicological Assessment	Applied Sciences (2020),	The article has been classified as relevant by full text - Category B and reliable

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
	CP 10.6.2	B. et al.		of a Glyphosate-Based Herbicide in Cover Plants: Medicago sativa L. as a Model Species.	Vol. 10, No. 15, Art. No. 5098	with restrictions for the following reason: The study does not alter risk assessment. All validity criteria according to OECD TG 208 cannot be evaluated. Test concentrations are not confirmed by analytical verifications. Only one tested species. In addition, the formulation tested is a potassium salt, whereas the AIR5 representative formulation MON 52276 contains an isopropylammonium salt.
59	CA 8.6.2, CP 10.6.2	Jang S. J. et al.	2020	Inhibition of wheat growth planted after glyphosate application to weeds.	Weed Science (2020), Vol. 68, No. 4, pp. 373-381	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: No endpoints are provided, the study does not alter risk assessment but the findings of the work could serve to support the lack of effects of glyphosate fresh and aged residues (0, 1, 3, 5, and 7 days) after sowing wheat seeds in soils previously treated with glyphosate at 600 g ae/ha as part of a broader discussion. The formulation tested contains an ammonium salt, which has a substantially higher loading than the AIR5 representative formulation MON 52276 that contain isopropylammonium salt. The tested formulation is not fully identified. No analytical verifications of the test concentration in soil were conducted. OECD TG 208 was not followed and therefore validity criteria cannot be assessed. No emergence was investigated, only growth. No ECx assessment was conducted. The number of tested individuals is insufficient.
60	CP 7.1.7	Gateva S. et al.	2020	Direct treatment with roundup vs. treatment with plant extract previously influenced by roundup: does the genotoxic effect differ?	Dokladi na Bolgarskata Akademiya na Naukite (2020), Vol. 73, No. 7, pp. 978-984	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides only supplementary information on cytotoxicity and genotoxicity of GBH, but not altering risk assessment. No specification of glyphosate formulation (test item). No negative control (formulation without glyphosate). No historical control data. Genotoxic effects only observed at cytotoxic concentrations.
61	CP 7.1.7	Haponenko Y. Y. et al.	2019	Zinc oxide nanoparticles enhance the hepatotoxic effects of glyphosate herbicide.	Medichna ta Klinichna Khimiya (2019), No. 4, pp. 32-36	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides information about effects of glyphosate based herbicide on liver parameters of rats, but does not alter risk assessment. The product used in the study is not sufficiently identified, the test substance was identified only as 'Roundup'. The surfactant system in the formulated product used in this study was not confirmed by the author. It is therefore not possible to confirm whether the product used contained POEA or not. Furthermore, study procedure, test species and animal housing conditions are not adequately described.
62	CP 7.1.7	Tizhe E. V. et al.	2020	Effect of zinc supplementation on chronic hepatorenal toxicity following oral exposure to glyphosate-based herbicide (Bushfire®) in rats.	The Journal of international medical research (2020), Vol. 48, No. 8, pp. 1-15	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The publication investigates whether zinc supplementation can improve toxicity caused by glyphosate. No new information on glyphosate toxicity itself is provided and the article does not alter risk assessment. Many important basic paramaters which are standard in the conduct and reporting of toxicology studies are absent; food consumption, body weight, body weight gain, clinical signs, diarrhea, etc. In addition, gavage of a surfactant containing mixture for 36 weeks would likely result in gastrointestinal effects, such are ulcers in the forestomach of rats, and necropsies were not performed to evaluate this significant consequence of repeated gavaging of surfactant. With the absence of recorded liver weights, potential adaptive responses of increased

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						circulating enzymes are not able to be put into context. Therefore, no context of the clinical chemistry findings can be understood.

Table 35: Relevant but supplementary (category B) articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
27	Abdel-Halim K. Y. et al.	CA 5.8.3	2020	Cytotoxicity and Oxidative Stress Responses of Imidacloprid and Glyphosate in Human Prostate Epithelial WPM-Y.1 Cell Line.	Journal of Toxicology (2020), Vol. 2020, Art. No. 4364650	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on cytotoxicity of glyphosate on prostate cells that does not alter risk assessment. The ability of glyphosate to induce in vitro cytotoxic and oxidative stress on normal human cells (prostate epithelial WPM-Y.1 cell line) was evaluated with the methyl tetrazolium test (MTT) and histopathological investigation. Cell viability was evaluated with an MTT test for 24 h. The median inhibition concentration (IC50) value was 0.025 mM for glyphosate. At low concentrations (mM), the examined pesticides significantly reduced cell viability and caused cell death. Coupling of cell viability, oxidative stress, and histopathological alterations provides good tools to assess the cytotoxicity of pesticides in vitro at low concentrations. Moreover, the abnormal damage of cell structure is considered an important signal of organ dysfunction. Metabolic activation system was not clearly and completely described. No HCD and no positive or negative control were reported.
57	Alhewairini S. S.	CA 8.4.2, CP 10.4.2	2020	Toxicity effects of glyphosate and metribuzin on five species of soil-dwelling predatory mites.	Pakistan Journal of Agricultural Sciences (2020), Vol. 57, No. 5, pp. 1429-1435	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: Provides information on the effects of glyphosate on the mortality of 5 soil-dwelling mite species, but other than that recommended in EU Reg. 283/2013 (Data requirements for AS). No relevant endpoints for the risk assessment are given. The study does not alter risk assessment. No real dose was provided: 1.1 L (glypho-48 or glyphosate as AS)/100L water, but it is unclear how many L of solution applied per ha? Individuals collected in the field with no information about those sites and previous exposures to pesticides. No clear information about maintainance of the mites previous to treatments in the laboratory. The experimental conditions (temperature and soil) are inadequately described and no validation data or analytical verifications are provided. No ECx assessment was conducted. The test is not performed according to any OECD guideline.
52	Almasri H. et al.	CA 8.3.1.2, CP 10.3.1.2	2020	Mixtures of an insecticide, a fungicide and a herbicide induce high toxicities and systemic physiological disturbances in winter Apis mellifera honey bees.	Ecotoxicology and environmental safety (2020), Vol. 203, Art. No. 111013	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Provides information on the effects of glyphosate on the survival of honey bees (at 3 different concentrations after 20 days continuous oral exposure) but no risk assessment relevant endpoints are given. The study does not alter risk assessment. Individual daily food consumption was not provided (it was calculated by dividing the food consumed per cage by the number of bees that remained alive each day in each cage. The same as suggested by the OECD TG 245). No ECx assessment was conducted. The pesticide concentrations in the sugar solution were checked by GC-MS/MS but values were not reported in article. The test is not performed according to the OECD TG 245 chronic oral toxicity test (longer exposure) and therefore it is not possible to properly assess validity criteria (control mortality after 10 days). Whilst the study presents survival data, the test was conducted as an extended

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						laboratory based study with a 20 day duration. This does not reflect an accepted test design used for Annex I renewal purposes. Despite 14 cages of 30 bees being for each exposure regimen, (cage design is not described), there are no standard error bars presented for the replication so the relevance of the proposed survival lines cannot be established from Figure 1, where survival in the glyphosate only groups, appears to be in the 80-90% up until day 12-15 and then at this point there appears also to be an effect in the control with survival dropping off sharply. A further point is that there is no positive control group for the DMSO used to enable dispersal of the substances. The influence of this on the overall toxicity is uncertain. Despite what appears to be a reliable test, there are some shortcomings in the test design.
49	Asnicar D. et al.	CA 8.2.4.2, CP 10.2.1	2020	Effects of Glyphosate-Based and Derived Products on Sea Urchin Larval Development.	JOURNAL OF MARINE SCIENCE AND ENGINEERING (2020), Vol. 8, No. 9, Art. No. 661	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: Provides information on the effects of glyphosate, AMPA and Roundup on the larval development of sea urchins but no risk assessment relevant endpoints are given. The study does not alter risk assessment. The purity of glyphosate and AMPA are not provided. The urchins were collected from the open environment and could have been exposed previously to pesticides. The experimental conditions are inadequately described (it is unclear if oxygen saturation > 80% applies to all treatment or just for respiration rate treatment). Light conditions are not reported. No validation data or analytical verifications are provided. No Ecx assessment was conducted.
18	Babich R. et al.	CA 5.8.2	2020	Kidney developmental effects of metal-herbicide mixtures: Implications for chronic kidney disease of unknown etiology.	Environment international (2020), Vol. 144, Art. No. 106019	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on kidney effects of glyphosate and does not alter risk assessment. The purpose of the publication was to investigate the possible causes of chronic kidney disease of unknown etiology (CKDu) which is an emerging global concern affecting several agricultural communities in the Americas and South Asia. The hypothesis was that exposure to contaminants such as heavy metals (e.g., Cd, As, Pb, and V) and organic pesticides (e.g., glyphosate) present in the drinking water could provoke the onset and progression of this disease in childhood. Using zebrafish Danio rerio, a toxicology and kidney disease model, the authors examined kidney developmental effects of exposure to (i) environmentally derived samples from CKDu endemic and non-endemic regions and (ii) Cd, As, V, Pb, and glyphosate as individual compounds and in mixtures. The authors found that drinking water is contaminated with various organic chemicals including nephrotoxic compounds as well as heavy metals, but at levels considered safe for drinking. Histological studies and gene expression analyses examining markers of kidney development (pax2a) and kidney injury (kim1) showed novel metal and glyphosate-metal mixture specific effects on kidney development. Glyphosate showed that interactive nephrotoxic effects of organic agrochemicals and heavy metals are an important consideration. For example, glyphosate at 10 ppb can induce kim1, implying that exposure to this chemical even at very low-levels can contribute to kidney injury. They postulate that

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						exposure to glyphosate coupled with individuals with impaired kidney development is likely to increase the initiation and progression of CKDu. However, gene expression data also suggest, when in a mixture with metals such as arsenic, glyphosate may have alternate effects on kidneys, including effects that may not be detrimental. Test system of the study is not clearly and completely described. Metabolic activation system is not clearly and completely described. Cytotoxicity tests are not reported. Only 1 dose level was used which does not allow a dose response analysis. Furthermore, no positive control and no HCD provided.
28	Ben Maamar M. et al.	CA 5.8.3	2020	Epigenome-wide association study for glyphosate induced transgenerational sperm DNA methylation and histone retention epigenetic biomarkers for disease.	Epigenetics (2020): Ahead of print. 10.1080/15592294.2020.1853319	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides only supplementary information on epigenetic effects of glyphosate and does not alter risk assessment. The current study was designed to identify epigenetic biomarkers for glyphosate-induced transgenerational diseases using an epigenome-wide association study (EWAS). Following transient glyphosate exposure of gestating female rats (F0 generation), during the developmental period of gonadal sex determination, the subsequent transgenerational F3 generation, with no direct exposure, were aged to 1 year and animals with specific pathologies identified. The pathologies investigated included prostate disease, kidney disease, obesity, and presence of multiple disease. The sperm were collected from the glyphosate lineage males with only an individual disease and used to identify specific differential DNA methylation regions (DMRs) and the differential histone retention sites (DHRs) associated with that pathology. Unique signatures of DMRs and DHRs for each pathology were identified for the specific diseases. However, a comparison of DMRs and DHRs of the glyphosate treated animals versus the control animals was not performed. It is not clear what has been actually tested. Test conditions are not clearly and completely described. Only one dose level was reported / no dose-response relationship. Number of animals used per dose level not reported. Method of analysis was not described for analysis test media (no validation, no verifications). Furthermore, no HCD reported, and no positive controls.
16	Coullery R. et al.	CA 5.7	2020	Exposure to glyphosate during pregnancy induces neurobehavioral alterations and downregulation of Wnt5a-CaMKII pathway.	Reproductive toxicology (2020), Vol. 96, pp. 390-398	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides useful information on neonates rats administered glyphosate after gestational exposure, but not altering risk assessment. In addition, IP injection is not a preferred route of administration for human exposure. Only 2 dose levels were tested and no information on the purity of glyphosate was reported. No analytical determinations performed. No historical control data provided. Lack of positive control and information allowing to assess the robustness of the investigations and results.
12	Crump K. et al.	CA 5.5	2020	Correcting for Multiple Comparisons in Statistical Analysis of Animal Bioassay Data.	Toxicological Sciences (2020) Vol. 177, Issue 2, pp. 523-524	The article has been classified as relevant by full text - Category B for the following reason: In this letter to Editor Crump et al. (2021) commented on Rusyn et al. (*Questioning Existing Cancer Hazard Evaluation Standards in the Name of Statistics. Toxicol Sci. (2020), Vol. 177, Issue 2, pp. 521-522*) where Rusyn et al. comments on the original Crump et al. article (*Accounting for Multiple Comparisons in Statistical Analysis of the Extensive Bioassay Data on*

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						Glyphosate. Toxicol Sci. (2020) Vol. 175, Issue 2, pp. 156-167). The original Crump et al. article was evaluated in the previous search and classified as relevant by full text (Category A and reliable without restrictions). The summary of the article was presented in the dossier under MCA 5.5./026. The appropriateness of the approach presented in the original article has been further reiterated in a Letter to the Editor (*Crump K. et al., Toxicological Sciences (2020), Vol. 177, Issue 2, pp. 523-524, Correcting for Multiple Comparisons in Statistical Analysis of Animal Bioassay Data*). Crump et al. replied to Rusyn et al. (*Questioning existing cancer hazard evaluation standards in the name of statistics. Toxicol Sci. (2020), Vol. 177, Issue 2, pp. 521-522*) and explain that the statistical method used in their analysis of the extensive bioassay data on glyphosate provides adequate interpretation of the p-values. They state that before a p-value can be interpreted appropriately, it must be correct, i.e., it must reflect the correct false positive rate for the hypothesis under consideration. The statistical method used in their analysis of the extensive bioassay data on glyphosate provides p-values that correct false positive rates by properly accounting for the multitude of tumours that require analysis by standard statistical methods. As the Letter to the Editor provides only supplementary information to the original Crump et al. article and does not alter risk assessment, the letter was classified as relevant by full text but of Category B (relevant but supplementary).
48	Cuzziol Boccioni A. P. et al.	CA 8.1.4, CP 10.1.3	2020	Toxicity assessment at different experimental scenarios with glyphosate, chlorpyrifos and antibiotics in Rhinella arenarum (Anura: Bufonidae) tadpoles.	Chemosphere (2020), Art. No. 128475, Ahead of print. doi.org/10.1016/j.chemosphere.2020.128475	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not alter risk assessment but the findings of the work could serve to discuss the sublethal effects (biological, morphological and enzymatic parameters) of two different glyphosate concentrations (1.25 and 2.5 mg/L) to tadpoles of an amphibian species as part of a broader weight of evidence. An endpoint cannot be derived. No analytical verifications of the test item concentrations are provided. Surface egg strings of R. arenarum used for the experiments were collected from temporary small ponds situated in the natural floodplain of the Parana River, considered as an unpolluted site (no analytical verification was however made). Only two concentrations were tested.
39	de Souza Ferreira; A. P. et al.	CA 6.10.1	2020	Glyphosate and aminomethylphosphonic acid (AMPA) residues in Brazilian honey.	Food Additives & Contaminants, Part B: Surveillance (2020): Ahead of Print doi.org/10.1080/19393210.2020.1855676	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Glyphosate residues were found in Brazilian honey (HR = 0.22 mg/kg). An AMPA residue of 0.1 mg/kg was detected in one sample. The residue levels found in the analysed samples are not directly relevant to the EU uses supported in the AIR dossier. However, the data may be useful to interpret the results of the EU monitoring data for glyphosate residues in honey. Therefore, they are considered as category B (supplementary information). The publication is reliable in most points, however origin of samples is not described in full detail.
54	Delkash-Roudsari S.	CA 8.3.1.4, CP 10.3.1.4	2020	Assessment of lethal and sublethal effects of	Ecotoxicology and environmental safety (2020),	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: No endpoints are provided, the study does not

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	et al.			imidacloprid, ethion, and glyphosate on aversive conditioning, motility, and lifespan in honey bees (Apis mellifera L.).	Vol. 204, Art. No. 111108	alter risk assessment but the findings of the work could serve to support the (low) chronic toxicity of glyphosate (sublethal effects) to honey bees as part of a broader discussion. The source of the test individuals is not clearly reported and the lack of a previous pesticide exposure cannot be excluded. The duration of the chronic study is not clear (bee lifespan) and there is no indication about the days the bees were exposed to the tested concentrations. Chronic dose metrics per bee cannot be precisely quantified. No analytical verifications of the test item concentrations in the chronic oral test were conducted. The test designs for the discrimination task and the rhythm, nicity monitoring are not recognisable for consideration at the EU level. In addition to glyphosate, RoundUp® Ready-to-Use Weed and Grass Killer were tested that cannot be related to the representative formulation for the glyphosate EU renewal (the representative formulation is MON 52276).
29	Diers S. et al.	CA 5.8.3	2020	Does glyphosate affect the in vitro maturation and further development of bovine oocytes? Original Title: Beeinflusst Glyphosat die In-vitro-Maturation und weitere Entwicklung boviner Oozyten?	Zuechtungskunde (2020), Vol. 92, No. 4, pp. 223-235	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on endocrine disruption, but not altering risk assessment. It is difficult to be interpreted because no HCD and no positive controls were used. The data requirement for endocrine disruption is not met, since neither mode of action nor ED properties are sufficiently shown due to no dose-response relationship for gene induction. In addition, the product used in the study is not sufficiently identified, the test substance was identified only as 'Roundup'. The surfactant system in the formulated product used in this study was not confirmed by the author. It is therefore not possible to confirm whether the product used, is the representative glyphosate formulation MON 52276 relevant for the glyphosate EU renewal and whether the product contained POEA or not.
10	Faniband M. H. et al.	CA 5.1	2021	Human experimental exposure to glyphosate and biomonitoring of young Swedish adults.	International journal of hygiene and environmental health (2021), Vol. 231, Art. No. 113657	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides only supplementary information on kinetics of glyphosate in human volunteers but not altering risk assessment. No information on the test item and its source or purity. Only one dose level was tested and biomonitoring was restricted to urinary excretion.
58	Fernandes B. et al.	CA 8.6.2, CP 10.6.2	2020	Ecotoxicological Assessment of a Glyphosate-Based Herbicide in Cover Plants: Medicago sativa L. as a Model Species.	Applied Sciences (2020), Vol. 10, No. 15, Art. No. 5098	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not alter risk assessment. All validity criteria according to OECD TG 208 cannot be evaluated. Test concentrations are not confirmed by analytical verifications. Only one tested species. In addition, the formulation tested is a potassium salt, whereas the AIR5 representative formulation MON 52276 contains an isopropylammonium salt.
37	Fu H. et al.	CA 5.8.3	2020	Effects of glyphosate-based herbicide-contaminated diets on reproductive organ toxicity and hypothalamic-pituitary-ovarian axis hormones in weaned piglets.	Environmental pollution (2020): Ahead of print. doi.org/10.1016/j.envpol.2020.115596	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article is not reliable for the following reason: The study did not follow any OECD guideline and was not performed under GLP conditions. No analytical verifications of the test item in the diet were performed. In addition, there was no information on food consumption reported, therefore the actual intake of glyphosate by the animals remains unclear. The piglet tested in the study is an animal species that is not routinely used to investigate reproductive performances. The authors did not provide information

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						on the sexual maturation in the tested strain which would have helped in the interpretation of parameters like the hormone levels and histopathology of the uterus and in the ovaries. Overall, for piglets that have been used in the recent years for investigation on potential effects on reproductive toxicity induced by a xenobiotic, it has been reported that in sexually immature animals a reliable histopathological and functional evaluation of possible test item–related effects on the female reproductive organs is not possible (1-4). In this study hormonal analyses has been performed only once at sacrifice when for reliable interpretation of the data, hormonal analysis should have been taken more times on the same animal (ideally before the treatment) and the time of sampling should be recorded. Therefore, the reliability of the hormonal data in this study is also questionable. In conclusion, the study presents many deficiencies and does not meet the basic scientific principles for this type of investigation and is it considered not to be reliable.
30	Ganesan S. et al.	CA 5.8.3	2020	Ovarian mitochondrial and oxidative stress proteins are altered by glyphosate exposure in mice.	Toxicology and applied pharmacology (2020), Vol. 402, Art. No. 115116	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This publication does not alter risk assessment negatively, since no (major) effects were found with any of the tested read outs. However, it could be used - with restrictions - as supporting evidence for lack of any effects of test item on liver, heart, spleen, kidney or uterine weight, AKT or gamma-H2AX protein abundance, or the ovarian level of steroidogenic proteins, or on estrous cyclicity and circulating E2 or P4. The study was performed following scientifically acceptable standards. However, reliability is given with restrictions since details on test item (e.g. purity), historical control data, positive controls and analysis of test media are missing.
60	Gateva S. et al.	CP 7.1.7	2020	Direct treatment with roundup vs. treatment with plant extract previously influenced by roundup: does the genotoxic effect differ?	Dokladi na Bolgarskata Akademiya na Naukite (2020), Vol. 73, No. 7, pp. 978-984	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides only supplementary information on cytotoxicity and genotoxicity of GBH, but not altering risk assessment. No specification of glyphosate formulation (test item). No negative control (formulation without glyphosate). No historical control data. Genotoxic effects only observed at cytotoxic concentrations.
19	Ghosh S. et al.	CA 5.8.2	2020	Cardiogenic shock with first-degree heart block in a patient with glyphosate-surfactant poisoning.	Tropical doctor (2020): Ahead of print. 10.1177/0049475520971594	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper is a case report that describes the case of a 34-year-old man who developed corrosive injury to his GI tract after ingesting 200 mL of formulated glyphosate. He went on to develop hypotension and transient multiorgan failure including myocardial dysfunction which improved with intensive supportive care. This sequence of events is not unexpected in large ingestions of formulated glyphosate.
43	Gomez-Ramos M. d. M. et al.	CA 6.3	2020	Pesticide residues evaluation of organic crops. A critical appraisal.	Food Chemistry: X 5 (2020), Art. No. 100079	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Analytical method development and optimisation for detection of multiple pesticides in crops with low LOQ. Monitoring data from 136 commercial organic samples showed no residues of glyphosate, n-acetyl glyphosate, AMPA, n-acetyl-AMPA. Origin of samples not fully described. For method validation it is relied on published data.

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20	Hao J. Y. et al.	CA 5.8.2	2020	Glyphosate-induced Delayed Pyloric Obstruction, Ulcer and Scar Changes.	Journal of the College of Physicians and Surgeons-Pakistan (2020), Vol. 30, No. 8, pp. 868-870	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper describes a case report of a 44-year-old woman who presented with pyloric obstruction two months after accidentally ingesting 100 mL of formulated glyphosate. After the initial ingestion, her family took her to the hospital where the patient was treated for 13 days and then discharged. She later returned to the hospital with recurrent nausea & vomiting, underwent endoscopy where they discovered scarring and pyloric obstruction. The patient underwent a partial gastrectomy and gastrojejunostomy with improvement of symptoms. This clinical course of events is not unexpected in significant ingestions of formulated glyphosate as these ingestions are corrosive and can cause scarring & gastric outlet obstruction.
61	Haponenko Y. Y. et al.	CP 7.1.7	2019	Zinc oxide nanoparticles enhance the hepatotoxic effects of glyphosate herbicide.	Medichna ta Klinichna Khimiya (2019), No. 4, pp. 32-36	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Article provides information about effects of glyphosate based herbicide on liver parameters of rats, but does not alter risk assessment. The product used in the study is not sufficiently identified, the test substance was identified only as 'Roundup'. The surfactant system in the formulated product used in this study was not confirmed by the author. It is therefore not possible to confirm whether the product used contained POEA or not. Furthermore, study procedure, test species and animal housing conditions are not adequately described.
31	Ingaramo P. et al.	CA 5.8.3	2020	Are glyphosate and glyphosate-based herbicides endocrine disruptors that alter female fertility?	Molecular and cellular endocrinology (2020), Vol. 518, Art. No. 110934	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The review article selectively reports results of in vitro and in vivo studies suggesting endocrine disrupting properties of glyphosate and glyphosate-based herbicides at low or "environmentally relevant" dose levels in the female reproductive tissue. Most of the studies focused on the endocrine-disrupting effects of glyphosate in endocrine-dependent tissues (ovary and uterus). The authors claim that most of these studies show effects at very low concentrations, which would be undetected in traditional toxicology studies. However, they did not adequately explain the design of the experiments, address potential confounders in the cited studies (e.g., overt and systemic toxicity, cytotoxicity) that impact the studies validity to inform an endocrine assessment, nor the reasons why the reported investigations can detect effects that the comprehensive database of regulatory toxicity studies for glyphosate were not able to ascertain. The most significant flaw with this review was the omission of numerous reliable and relevant published in vitro and in vivo studies, and publicly available regulatory assessments, that are critical to inform a weight of evidence assessment for glyphosate and GBHs. The missing information was largely included in the recent 2017 EFSA Glyphosate ED weight of evidence evaluation where it was concluded that glyphosate is not an endocrine disruptor. Figure 1 proposes mechanisms of endocrine disruption that include impact on aromatase activity, estrogenic effects through a ligand-independent mechanism,

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						cell proliferation, and expression of oestrogen-dependent proteins. It was concluded in the recent 2015 USEPA and 2017 EFSA weight of evidence ED assessments that glyphosate does not impact steroidogenesis including aromatase activity. Findings in the articles cited in figure 1 for aromatase activity are confounded by non-specific effects of supraphysiological concentrations of the surfactant in these formulations in in vitro or in vivo systems. There is no evidence of glyphosate impacting aromatase expression or activity by assessing apical endpoints in the comprehensive toxicology database for glyphosate (for review see Levine et al. 2020). Figure 1 also purports that glyphosate is a ligand for the oestrogen receptor. It has been well established that glyphosate in not a ligand for the oestrogen receptor and does not transactivate the oestrogen responsive genes endpoints (for a comprehensive review of the oestrogen pathway see Levine et al. 2020). The paper cited in figure 1 to support a ligand-independent mechanism by Mesnage et al. 2017 was reported to only occur at the unrealistic exposure concentration of 20,000 mg glyphosate a.e./L (118 µm) and by activating protein kinase A that increases the phosphorylation and activation of the oestrogen receptor. Mesnage et al. did not provide evidence in their paper that the phosphorylation status of the oestrogen receptor was changed to support their hypothesis nor is this hypothesis consistent with the weight of evidence from validate functional assays. Figure 1 also proposes that glyphosate can cause cell proliferation through and endocrine mechanism. This hypothesis is inconsistent with results of the comprehensive database of glyphosate toxicology studies. The key citation that support this hypothesis is by Thongprakaisang et al. 2013. Mesnage et al. 2017 concluded the results in Thongprakaisang et al. 2013 likely result from contamination and not glyphosate. An earlier study that reported modest proliferation by glyphosate only occurred at the extremely high concentration of 1000 µM and the authors concluded that the modest proliferation observed in their study resulted from a non-endocrine mechanism (Lin and Garry, 2000). The final endocrine mechanism described in figure 1 refers to expression of oestrogen-dependent proteins. The significance of these findings is questionable based on the results of the endocrine screening battery reviewed by EFSA in 2017 and the comprehensive regulatory toxicology database for glyphosate. The authors, however, recognize that it was not possible to reproduce in vivo most of the effects of glyphosate and/or GBHs observed in vitro. They claim this could be due that the species tested are not the appropriate ones and claimed that the sheep constitute a highly appropriate model to evaluate the effects of EDCs due to the similarity between sheep and humans, especially regarding gestational and thyroid physiologies and brain ontogeny. However, robust data supporting this assumption are limited.
59	Jang S. J. et al.	CA 8.6.2, CP 10.6.2	2020	Inhibition of wheat growth planted after glyphosate application to weeds.	Weed Science (2020), Vol. 68, No. 4, pp. 373-381	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: No endpoints are provided, the study does not alter risk assessment but the findings of the work could serve to support the lack of effects of glyphosate fresh and aged residues (0, 1, 3, 5, and 7 days)

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						after sowing wheat seeds in soils previously treated with glyphosate at 600 g ae/ha as part of a broader discussion. The formulation tested contains an ammonium salt, which has a substantially higher loading than the AIR5 representative formulation MON 52276 that contain isopropylammonium salt. The tested formulation is not fully identified. No analytical verifications of the test concentration in soil were conducted. OECD TG 208 was not followed and therefore validity criteria cannot be assessed. No emergence was investigated, only growth. No ECx assessment was conducted. The number of tested individuals is insufficient.
44	Khan N. et al.	CA 6.3	2020	Assessment of Health Risk due to Pesticide Residues in Fruits, Vegetables, Soil, and Water.	Journal of Chemistry (2020), Vol. 2020, Art. No. 5497952	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, does not alter risk assessment. Fruit, vegetable, soil and water samples from Pakistan were analysed for glyphosate residues (monitoring), with detects in fruits and vegetables. Missing validation data, analytical method and origin of samples not sufficiently described.
21	Kimura T. et al.	CA 5.8.2	2020	Renal tubular injury by glyphosate-based herbicide.	Clinical and experimental nephrology (2020), Vol. 24, No. 12, pp. 1186	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This is a case report with an image showing proximal tubular epithelial injury in a 78-year-old woman who ingested formulated glyphosate in a suicide attempt. This ingestion resulted in transient renal failure which improved with hemodialysis. This in not unexpected in large suicidal ingestions.
55	Lacava M. et al.	CA 8.3.2, CP 10.3.2.2	2021	The pest-specific effects of glyphosate on functional response of a wolf spider.	Chemosphere (2021), Vol. 262, Art. No. 127785	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: No endpoints are provided, the study does not alter risk assessment but the findings of the work could serve to support the sub-lethal effects (on the feeding rate) of glyphosate on a ground-dwelling spider as part of a broader discussion. The test substance was identified only as ‘Roundup’. The surfactant system in the formulated product used in this study was not confirmed by the author. It is therefore not possible to confirm whether the product used contained POEA or not. The tested individuals were collected from native forests from Uruguay and previous pesticide exposure cannot be excluded. The tested substance has not been fully identified. A tested rate is not provided (just that a glyphosate solution with a concentration of 280 mg/L a.i. was used). Tested individuals were exposed by contact for only 30 minutes. The experiment run in glass containers only for 4 hours, so only acute effects were assessed. Only one concentration was tested. The outcome of the study not only depends on the effects of glyphosate, but also on the tested prey (different results depending on the prey). The test is not conducted according to any guidance and therefore, it is not possible to confirm whether the study meets any validity criteria.
32	Levine S. L. et al.	CA 5.8.3	2020	Review and analysis of the potential for glyphosate to interact with the estrogen, androgen and thyroid pathways. Special Issue: Glyphosate exposure and	Pest Management Science (2020), Vol. 76, No. 9, pp. 2886-2906	The article has been classified as relevant by full text - Category B for the following reason: The article is a review article providing a good summary and also further analysis on possible endocrine disrupting properties of glyphosate in USEPAs endocrine disruptor screening program (EDSP) and further literature but does not alter risk assessment.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
				toxicology.		
13	Lorenz V. et al.	CA 5.6, CA 5.8.3	2020	Perinatal exposure to glyphosate or a glyphosate-based formulation disrupts hormonal and uterine milieu during the receptive state in rats.	Food and chemical toxicology (2020), Vol. 143, Art. No. 111560	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article is not reliable for the following reason: The study does not follow any OECD testing guideline, therefore the experimental design and procedures should be not only explained but validated against appropriate reference substances and the interpretation of the results should be supported by adequate historical control data that allow the correct interpretation of the relevance of a change. This is particularly true when assessing the biological relevance of hormonal changes and/or the assessed gene expression. In this publication such data are not provided. It is not clear why only 9 F1 females/group were selected to assess the effects on the pre-implantation phase and not a higher number to cover the basal hormonal variations observed, which should be high based on the scattered values observed in the control group of this study. The authrors claim that there was an imbalance in the serum levels of estradiol 2 in relation to progesterone, but the progesterone values were apparently not impacted. Similarly, they claim that glyphosate induced significantly the ERα expression at protein level subepithelial stroma of the uteri (which was not observed in other parts of the uterus), although no changes were observed in ERα mRNA expression but do not take into consideration the inconsistency of their results. Similarly, they concluded that glyphosate provoked aberrant expression on implantation-genes although a consistent response was not observed among all the tested genes. The reproductive performance data of F1 females is not reported in a transparent way: only selected photos of the uterus are presented to indicate that there was a decrease in the number of implantation sites. However, the actual number of the implantation sites per animals are not reported. Similarly the number of corpora lutea, resorption sites and preimplantation loss are represented in graphics (figure 2A, B and C), but the actual number have not been given. So, the authors do not provide the reader of an objective information to understand whether an effect did occur. Overall, this publication presents several deficiencies and bias in reporting the results of their investigations and as such is considered to be not reliable.
45	Lozowicka B. et al.	CA 6.3	2019	Pesticide residues in seeds of winter oilseed rape (Brassica napus L.).	Progress in Plant Protection (2019), Vol. 59, No. 4, pp. 199-205	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Monitoring data from OSR samples collected in Poland during 2016-2019. Glyphosate residues found in 14% of samples (max 0.27 mg/kg). Analytical method not fully described, origin of samples not fully described.
17	Masood M. I. et al.	CA 5.7	2020	Environment permissible concentrations of glyphosate in drinking water can influence the fate of neural stem cells from the subventricular zone of the	Environmental pollution (2020), Vol. 270, Art. No. 116179	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on neurotoxicty (in vitro experiment), but does not alter risk assessment. The reporting on the test material is limited. Ca2+ uptake was investigated at too high concentrations not relevant for assessment (> 1mM), but the remaining endpoints were investigated at suitable concentrations (< 1

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
				postnatal mouse.		mM). No positive or negative controls were included and historical control data were not provided.
14	Milesi M. M. et al.	CA 5.6.1	2020	Correction to: Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats (Correction to Archives of Toxicology (2019) 93:3635–3638).	Archives of Toxicology (2020), Vol. 94, No. 8, pp. 2897–2898	The article has been classified as relevant by full text - Category B for the following reason: This is a serie of comments and corrections connected to the article by Milesi et al. (*Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2018), Vol. 92, No. 8, pp. 2629-2643*). This article was evaluated in the previous search and classified as relevant by full text - Category B. In order to reflect the category of the main article, the correction was also classified as Category B. The correction corrects Table 1 of the publication, which lists factors associated with the pre-implantation loss rate and factors associated with feto-placental parameters of F2 offspring in control and glyphosate-based herbicede-treated female rats. The serie contains e.g. following articles, comments and corrections: Milesi et al., Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2018);92(8):2629-2643. Plewis, Comment on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2019);93(1):207. Milesi et al., Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2019);93(12):3635-3638. Paumgartten, Comment on Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats, Arch Toxicol 92:2629-2643 : On the impairment of female reproductive performance by developmental exposure to a glyphosate-based herbicide. Arch Toxicol. (2019);93(3):831-832. Plewis, Comment on response from Milesi et al. to Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2020);94(1):351-352. Milesi et al., Correction to: Response to comments on: Perinatal exposure to a glyphosate-based herbicide impairs female reproductive outcomes and induces second-generation adverse effects in Wistar rats. Arch Toxicol. (2020);94(8):2897-2898.
51	Motta E. V. S. et al.	CA 8.3.1.1.2, CA 8.3.1.4, CP 10.3.1.1.2, CP 10.3.1.4, CP 10.3.1.6	2020	Oral or Topical Exposure to Glyphosate in Herbicide Formulation Impacts the Gut Microbiota and Survival Rates of Honey Bees.	Applied and environmental microbiology (2020), Vol. 86, No. 18	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: No proper endpoints are provided (only acute toxicity at 24h). The study does not alter risk assessment, but the findings of the work could serve to support the acute contact toxicity to bees and further sub-lethal effects of glyphosate (mortality) on honey bees as part of a broader discussion. Both laboratory and field experiments were conducted. The study is

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						focused on the effects of glyphosate on bee gut microbiota. The glyphosate standard tested item is not fully described. No analytical verifications of the test item concentrations in the medium were conducted. Study is not compliant with any accepted guideline and therefore validity criteria cannot be assessed. Glyphosate was tested topically at different concentrations and only EC50 assessment (at 24 h instead of at 48 h as recommended by the guidance) was performed. A dose-response effect was observed in several parameters studied (not only mortality). For the field experiments, there is no security that the bees haven't been exposed to pesticides before the tests started. Findings cannot be related directly to impacts at the population level therefore influence on direct level and indirect assessment is uncertain. Nor is this a study type driven by data requirements. In additon, the tested formulation is not related to the representative formulation for the AIR5 (MON 52276).
33	Munoz J. P. et al.	CA 5.8.3	2020	Glyphosate and the key characteristics of an endocrine disruptor: A review.	Chemosphere (2020): Ahead of print. doi.org/10.1016/j.chemosphere.2020.128619	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. Munoz et al. based on the ten key characteristics (KC) of Endocrine Disrupting Chemicals (EDCs) recently proposed (La Merrill et al., 2020) reviewed a selective set of publications related to glyphosate as a possible endocrine disruptor. The authors claim that glyphosate exhibited eight of the ten KCs of an EDC. This checklist of KC was not created in conjunction with nor is it recognised by any regulatory agency as a replacement for established weight of evidence approaches used by regulatory agencies to assess whether a compound is an endocrine disruptor. The authors did not perform a systematic review for glyphosate of the publicly available information resulting in a significant flaw with this publication, the omission of numerous reliable and relevant published in vitro and in vivo studies, and publicly available regulatory assessments, that are critical to inform a weight of evidence assessment for glyphosate. Glyphosate has undergone extensive regulatory testing and assessment to evaluate its potential to be an endocrine disruptor. In 2015 the US EPA released its weight of evidence evaluation of glyphosate and more recently the European Food Safety Authority in 2017, who independently performed an endocrine assessment as part the of the glyphosate renewal process. Both agencies concluded based on the US EPA EDSP battery and all other scientifically relevant information that glyphosate does not interact with the oestrogen, androgen thyroid and steroidogenic pathways and concluded that glyphosate is not an endocrine disruptor. Furthermore, the cited studies in Munoz et al. 2020 were not critically evaluated for relevance and reliability nor evaluated with a weight of evidence to conclude whether the criteria for each key characteristic was met. The authors state “Here, we conduct a comprehensive review where we describe the most important findings of the glyphosate effects in the endocrine system and assess the mechanistic evidence to classify it as and EDC”. However, many of the studies the authors cite as evidence for glyphosate meeting one of the KC they used studies that were conducted with a glyphosate-based formulation only. The

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						authors generally focused on a small subset of papers that used non-standard in vitro methods that tested glyphosate-based formulations at unrealistically high levels and in vivo studies that don't follow international guidelines. These papers inflate the relevance of findings derived from their in vitro models to the in vivo situation and invariably fail to discuss or recognize confounding effects of the formulation. As a result, these papers are not considered to be reliable for an endocrine assessment.
22	Nayak S. et al.	CA 5.8.2	2020	Deliberate self-poisoning in south odisha: study of its clinical profile and outcome.	Asian Journal of Pharmaceutical and Clinical Research (2020), Vol. 13, No. 8, pp. 169-173	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper aimed to characterize the nature of self-poisoning in the Odisha region of India. Over a 2-year period they evaluated 200 patients who presented to the Maharaja Krishna Medical College and found that 149 (74.5%) patients had ingested pesticides. 10 patients ingested glyphosate. 9 developed nausea & vomiting, 2 developed corrosive injury to their GI tracts, 2 had pneumonitis likely due to aspiration, 2 developed hypotension, 2 had altered mental status, 2 developed dysrhythmias, 3 had dysphagia, 3 had dehydration & 2 died. There was certainly overlap in the clinical picture as there are more symptoms described than patients. The symptoms described are not unexpected as large ingestions of formulated glyphosate causes corrosive injury to the GI tract and subsequent hypotension & multiorgan failure.
40	Panseri S. et al.	CA 6.10.1	2020	Pesticides and Environmental Contaminants in Organic Honeys According to Their Different Productive Areas toward Food Safety Protection.	Foods (2020), Vol. 9, No. 12	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Monitoring data from organic honey samples (n = 98) collected in Italy (Apulia) during 2019-2020. Residues of glyphosate, AMPA and glufosinate were not found in any sample. References are provided to validation of analytical methods. Source of honey samples are not exactly described.
41	Petcu C. D. et al.	CA 6.10.1	2020	Study regarding the honey contamination degree assessed in a specialized production unit.	Scientific Papers, Series D. Animal Science (2020), Vol. 63, No. 1, pp. 442-449	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Supplementary information only, not altering risk assessment. Samples from "honey sourced from beekeepers from the centre and Southern Romania (in order to form a large and homogeneous batch)" were analysed. Analysis done by LC-MS/MS with poor method description and no validation data. Residues of glyphosate were below the limit of quantification (<0.01 mg/kg) in 15 acacia and 15 polyfloral honey samples.
15	Refaie A. A. et al.	CA 5.6.2	2020	DNA and liver damage induced by glyphosate herbicide in suckling pups of wistar rat.	Current Topics in Toxicology (2020), Vol. 16, pp. 205-214	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article is not reliable for the following reason: Storage conditions of test item not reported. Animal strain not further specified and age of dams not reported. No analysis of test item in solvent performed. Insufficient number of animals/group tested. It should be noted that the experimental unit for such an experimental design is the litter, not the individual pups. Therefore, statistical evaluations should have been conducted to compare across litters, where n = 2, affording only one degree of freedom for statistical comparisons.
23	Ren Y. et al.	CA 5.8.2	2020	Case report of pyloric obstruction caused by	Acta Medica Mediterranea (2020), Vol. 36, No. 6, pp.	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
				glyphosate herbicides.	3485-3488	paper is a case series describing 3 patients with formulated glyphosate ingestions. The authors describe pyloric obstruction and laryngeal scarring in the patients. Formulated glyphosate is caustic to the GI tract and airways so this clinical scenario is not unexpected.
56	Sekrecka M.	CA 8.3.2.2, CP 10.3.2.2	2019	Influence of pesticides and bioregulators on the number of predatory mite Typhlodromus pyri (Phytoseiidae). Original title: Wplyw srodkow ochrony roslin oraz bioregulatorow na liczebnosc drapieznego roztocza dobroczynka gruszowca Typhlodromus pyri (Phytoseiidae).	Zeszyty Naukowe Instytutu Ogrodnictwa (2019), Vol. 27, pp. 41-52	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides information on the mortality of T. pyri mites 7 days after exposure but no risk assessment relevant endpoint can be obtained from the study. The study does not alter risk assessment. The test item is not fully described. The tested dose in g a.s./ha is not clear. Source of the tested individuals not fully reported (conditions of the lab mass rearing). The test design and the developmental phase of the tested individuals are not relatable to EU risk assessment (apple slices sprayed using a potter tower and then after drying, animals introduced). No agreed guidance has been followed (Bluemel et al., 2000).
24	Shin J. et al.	CA 5.8.2	2020	Severe chemical burns related to dermal exposure to herbicide containing glyphosate and glufosinate with surfactant in Korea.	Annals of occupational and environmental medicine (2020), Vol. 32, Art. No. E28	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This article is a case report detailing an injury sustained by a farmer who was reportedly spraying a glyphosate/glufosinate herbicide formulation, spilled the contents of his back pack on his right shoulder & hip, did not wash the formulation off and presented 3 days after with rapidly progressive necrotizing wounds that have a necrotizing fasciitis appearance in the photos. Unfortunately, the patient succumbed to his injuries. These herbicides are not corrosive to the skin in this fashion, it is impossible to tell what the farmer was exposed to in this scenario as infectious processes can result in a very similar clinical appearance. This is completely atypical and should not be associated with glyphosate exposure.
11	Skanes B. et al.	CA 5.4, CA 5.5, CA 5.6	2021	Hazard assessment using an in-silico toxicity assessment of the transformation products of boscalid, pyraclostrobin, fenbuconazole and glyphosate generated by exposure to an advanced oxidative process.	Toxicology in vitro : an international journal published in association with BIBRA (2021), Vol. 70, Art. No. 105049	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: Article provides only supplementary information on in silico evaluation of genotoxicity, acute oral toxicity or carcinogenicity but not altering risk assessment. Only one type of software was used for each endpoint. Toxtree was used to address Cramer classification, Ames test, carcinogenicity / mutagenicity, DNA binding and micronucleus assay. Toxicity estimation software tool (TEST) was used to address developmental toxicity and the rat oral LD50. The toxicity evaluation based on single software was considered not robust enough.
47	Solomon K. R.	CA 6.9	2020	Estimated exposure to glyphosate in humans via environmental, occupational, and dietary pathways: an updated review of the scientific literature. Special Issue: Glyphosate exposure and toxicology.	Pest Management Science (2020), Vol. 76, No. 9, pp. 2878-2885	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: The article provides only supplemental information, which does not alter risk assessment. No endpoint was derived. Extended risk assessment using published exposure data for air, water, bystanders, the general public, domesticated animals, pets, and applicators. Based on this large dataset, no risk to any exposure pathway/group was identified. The article is reliable with respect to risk assessment methodologies applied, i.e. well described methodologies and data set for analysis.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
38	Spinaci M. et al.	CA 5.8.3, CP 7.1.7	2020	Glyphosate and its formulation Roundup impair pig oocyte maturation.	Scientific reports (2020), Vol. 10, No. 1, Art. No. 12007	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides only supplementary information on maturation, steroidogenesis and oxidative stress markers of cumulus-oocyte complexes (COCs) from pigs, but not altering risk assessment. In addition, effects were mainly found at unphysiologically high doses (> 1 mM). The purity and storage conditions of the test item were not reported. No cytotoxicity testing performed, no positive and truly negative controls performed and also no historical control data provided. No metabolic activation system applied.
25	Stajnko A. et al.	CA 5.8.2	2020	Seasonal glyphosate and AMPA levels in urine of children and adolescents living in rural regions of Northeastern Slovenia.	Environment international (2020), Vol. 143, Art. No. 105985	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper aimed to measure glyphosate and AMPA exposure in children & adolescents in Slovenian agricultural areas. They measured 1st morning urines in the 246 participants in the winter and again in 225 participants in the summer. They addressed the fact that the detection of AMPA could come from other detergent exposures and not from glyphosate alone. 221 blood samples were also drawn in the first sampling period. They detected glyphosate in 27% of the urine samples from the winter and 22% in the summer. Their data demonstrate much lower glyphosate concentrations than reported in other parts of the world. A large percentage of the children had concentrations less than the LOQ with 72% of the younger children & 74% of the older children testing below the LOQ in the first sampling period, and 79% of the younger & 76 % of the older testing below the LOQ in the 2nd period. The estimated systemic dose of glyphosate was 0.003 mcg/kg of body weight – significantly below the ADI of 0.1 mg/kg of body weight. This article supports the evidence that glyphosate exposures tend to be very low and don't pose a health risk.
53	Strobl V. et al.	CA 8.3.1.2, CP 10.3.1.2	2020	Positive Correlation between Pesticide Consumption and Longevity in Solitary Bees: Are We Overlooking Fitness Trade-Offs?	Insects (2020), Vol. 11, No. 11, Art. No. 819	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Provides information on the survival of solitary bees after chronic exposure to glyphosate (at 1 single concentrations after 10 days continuous oral exposure) but no risk assessment relevant endpoints are given. The study does not alter exisiting risk assessment. Although the Osmia bicornis tested adults were obtained from cocoons reared in the laboratory, original individuals were transferred from organic orchards in Germany and previous pesticide exposure cannot be totally excluded. Measured parameters are not clearly described and there seems to be an error/typo in the glyphosate dose at which the bees were exposed. Sucrose solution consumption was recorded but no analytical verifications of the test item concentrations in the medium were conducted. No guidance document is available yet for lab studies with solitary bees. No ECx assessment was conducted for any of the parameters studied.
50	Tajnaiova L. et al.	CA 8.2.6.1, CA 8.2.7, CP 10.2.1	2020	Determination of the Ecotoxicity of Herbicides Roundup (R) Classic Pro and Garlon New in Aquatic and Terrestrial Environments.	Plants-Basel (2020), Vol. 9, No. 9, Article No. 1203	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This study investigates the effect of Roundup® Classic Pro (not relevant for the AIR5, as it contains the additive surfactant ether alkylamine ethoxylate) and AMPA on the aquatic organisms duckweed Lemna minor and green algae Desmodesmus subspicatus and on the

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						enzymatic activity of soil. The endpoints for AMPA do not alter risk assessment but are supportive of low exposure risk (relevant growth inhibition endpoints obtained for both green algae and macrophytes: Desmodesmus subspicatus (green alga): 72 h AMPA IC50 = 117.8 mg/L; 72 h AMPA IC50 with pH adjusted solution = 192.1 mg/L). No analytical verifications of the test item concentrations in the medium were conducted. The experimental design was carried out according to the following standards: EN ISO 8692 (Water Quality-Fresh Water Algal Growth Inhibition Test with Unicellular Green Algae (ISO 8692:2012)) and EN ISO 20079 (Water Quality-Determination of the Toxic Effect of Water Constituents and Waste Water on Duckweed (Lemna minor)-Duckweed Growth Inhibition Test (ISO 20079:2005)). Only the IC50 assessment was performed. There is no analytical to confirm exposure. Results are also ambiguous in that % inhibition plots are presented but data presented is unknown (rate or biomass or cell density?).
6	Tauchnitz N. et al.	CA 7.1.3, CA 7.1.1.2	2020	Assessment of pesticide inputs into surface waters by agricultural and urban sources - A case study in the Querne/Weida catchment, central Germany.	Environmental pollution (2020), Vol. 267, Art. No. 115186	The article describes pesticide analyses, amongst them glyphosate, in surface waters and in soil samples within a German catchment area (CA 7.5). Additionally, batch adsorption (CA 7.1.3) and anaerobic soil degradation experiments (CA 7.1.1.2) were conducted. For CA 7.5, the article has been classified as relevant by full text - Category A and reliable without restrictions: A detailed summary for CA 7.5 is provided. Please refer to Tables 32 and 33 above. For CA 7.1.1.2 and CA 7.1.2, see below. The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability** for CA 7.1.1.2 and CA 7.1.3 for the following reason: CA 7.1.1.2: For the anaerobic degradation experiment, the methods are well described, however the experimental design is not in agreement with the relevant guideline (OECD 307), e.g. due to use of synthetic rainwater, insufficient information on the test concentrations, use of slurry of a liquid-solid ratio of 0.3:1, air-tight incubation and analysis of pore water, only. From the information provided, it cannot be concluded on the representativeness of the soils used. Further, besides the final half-live, no detailed results are reported. Thus, no conclusion can be made on the quality of the results. The results from the anaerobic degradation experiment are therefore considered **not reliable**. CA 7.1.3: For the batch adsorption experiment, the methods are well described, however the experimental design is not in agreement with the relevant guideline (OECD 106), e.g. due to use of synthetic rainwater instead of CaCl2 solution, insufficient information on the test concentrations and a temperature of 10 °C. From the information provided, it cannot be concluded on the representativeness of the soils used. Further, besides the final adsorption parameters, no detailed results are reported. Thus, no conclusion can be made on the quality of the results. The adsorption results are therefore considered **not reliable**.
46	Tittlemier	CA 6.5.3	2020	Fate of glyphosate in wheat	Cereal Chemistry (2020):	The article has been classified relevant by full text - Category B and reliable with

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
	S. A. et al.			during milling and bread production.	Ahead of Print DOI: 10.1002/cche.10369	restrictions for the following reason: Supplementary information only. No endpoint is derived. The study does not alter risk assessment. This study is considered supportive for processing of wheat, however no clear processing factors can be derived. Absence of validation data in different processed wheat matrices. For the analytical method it is referred to another publication (Tittlemier et al., 2017).
62	Tizhe E. V. et al.	CP 7.1.7	2020	Effect of zinc supplementation on chronic hepatorenal toxicity following oral exposure to glyphosate-based herbicide (Bushfire®) in rats.	The Journal of international medical research (2020), Vol. 48, No. 8, pp. 1-15	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The publication investigates whether zinc supplementation can improve toxicity caused by glyphosate. No new information on glyphosate toxicity itself is provided and the article does not alter risk assessment. Many important basic paramaters which are standard in the conduct and reporting of toxicology studies are absent; food consumption, body weight, body weight gain, clinical signs, diarrhea, etc. In addition, gavage of a surfactant containing mixture for 36 weeks would likely result in gastrointestinal effects, such are ulcers in the forestomach of rats, and necropsies were not performed to evaluate this significant consequence of repeated gavaging of surfactant. With the absence of recorded liver weights, potential adaptive responses of increased circulating enzymes are not able to be put into context. Therefore, no context of the clinical chemistry findings can be understood.
34	Toth G. et al.	CA 5.8.3	2020	Cytotoxicity and hormonal activity of glyphosate-based herbicides.	Environmental pollution (2020), Vol. 265, No. Pt B, Art. No. 115027	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This article provides only supplementary information for risk assessment, since the in vitro experiments were performed with yeast instead of human cells. Nevertheless, the findings showed, that neither glyphosate nor AMPA impaired estrogenic or androgenic activity in the test system. Purity and storage conditions of test items and historical control data not reported. Positive controls applied, but data not shown. This study claims that POEA and some glyphosate-based formulations are estrogenic and/or androgenic. However, the study does not provide reliable information that POEA or any of the tested formulations are estrogenic and/or androgenic. The results claiming estrogenicity and/or androgenicity of the formulations are not in agreement with what would be predicted based on chemical structures of the surfactants and are apparently confounded by cytotoxicity based on responses presented within the paper. Because of the surface-active properties (i.e. surfactant properties) of POEA and other surfactants, it is very difficult to generate interpretable results from in vitro or cell-based assays, like the yeast assay, with surfactants. Rather, conclusions of estrogenicity and androgenicity should be based on in vivo studies. Even if the activity levels claiming estrogenic or androgenic activity are taken at face value, their potency for the estrogen and androgen receptors is so low these responses are not considered biologically relevant and realistic exposures to these substances are far below reported effect levels in the paper.
26	Xiao L. et al.	CA 5.8.2	2021	A 9-year retrospective study of poisoning-related deaths in Southwest China (Sichuan).	Forensic Science International (2021): Ahead of Print	The article has been classified as relevant by full text - Category B for the following reason: Medical data not altering the existing risk assessment. This paper describes retrospective study evaluating 782 poisoning deaths in Sichuan

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
					10.1016/j.forsciint.2020.110558	Province, China. The deaths were characterized as accidental, suicidal or homicidal. Pesticide ingestion was responsible for 40% of deaths. Only 2 deaths were related to glyphosate formulations and no details were given about the cases.
42	Yaqub G. et al.	CA 6.10.1	2020	Monitoring and risk assessment due to presence of metals and pesticides residues in honey samples from the major honey producing forest belts and different brands.	Food Science and Technology (2020), Vol. 40, No. Suppl. 1, pp. 331-335	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: 25 samples of different national (Pakistan) and international honey brands were collected for analysis of residues of heavy metals and pesticides. Glyphosate residues were detected in 5 samples in a range of 0.44 - 3.5 mg/kg (ppm). The residue levels found in the analysed samples are not directly relevant to the EU uses supported in the AIR dossier. However, the data may be useful to interpret the results of the EU monitoring data for glyphosate residues in honey. Therefore, they are considered as category B (supplementary information). The publication is reliable, but with several restrictions, i.e. missing validation data, analytical method and origin of samples are not sufficiently described.
35	Zhang C. et al.	CA 5.8.3	2020	Molecular Basis for Endocrine Disruption by Pesticides Targeting Aromatase and Estrogen Receptor.	International journal of environmental research and public health (2020), Vol. 17, No. 16, Art. No. 5664	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides only supplementary information on in vitro data and binding information gained by in silico models but not altering risk assessment. Limited information on test material (batch, analytical purity) provided. Historical control data were not included. The reported inhibition of aromatase activity (up to 30% at 100 µM glyphosate acid) is likely related to using ethanol or DMSO as a solvent for glyphosate, rather than water or buffer. Glyphosate is not soluble in an organic solvent, like ethanol or DMSO, and this likely confounded the results of the assay because glyphosate was not fully solubilized. Zhang et al. used recombinant CYP19 at low protein levels in the assay and did not add a “buffering protein” like BSA, which made the aromatase enzyme, and its associated reductase, susceptible to denaturization. Consistent with denaturing the aromatase enzyme, the slope of the inhibition curve was extremely shallow, uncharacteristic of aromatase inhibition, and likely reflects confounding effects of undissolved test substance. In the USEPA’s test guideline for aromatase activity, activity of < 25% is considered negative and activity between 25% and < 50% is considered equivocal. Greater than 50% inhibition must be estimated for a substance to be considered positive in EPA’s guideline study.
36	Zhang J. et al.	CA 5.8.3	2021	Melatonin alleviates the deterioration of oocytes and hormonal disorders from mice subjected to glyphosate.	Molecular and cellular endocrinology (2021), Vol. 520, Art. No. 111073	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The publication investigates whether melatonin can improve reproductive defects caused by glyphosate. No new information on glyphosate toxicity is provided and the article does not alter risk assessment. There is a limited information on test material provided (no information on source, batch or purity), limited information on test animals (no information on housing, environmental conditions or weight), no historical control data provided.

Table 36: Articles of unclear relevance (category C) after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
63	CA 5.9.4	Intayoung U. et al.	2020	Effect of Occupational Exposure to Herbicides on Oxidative Stress in Sprayers.	Safety and Health at Work (2020): Ahead of print. doi.org/10.1016/j.shaw.2020.09.011	The relevance of this article is unclear (Category C) for the following reason: The underlying rationale for this study was that an increase in the urinary MDA level after a pesticide application would be indicative of a toxic effect of pesticides with potential future health consequences. In order to assess MDA levels related to an application, the authors used the collection and analysis of spot urine samples before and after a workday that involved application of either glyphosate alone (n = 52 or 56.0%), glyphosate and paraquat (n = 7 or 7.5%), or glyphosate and 2,4-D (n = 34, 36.5%). In essence, the authors were using a self-controlled pre/post study design with individuals acting as their own controls. The average difference between pre-application and post-application MDA values within the same individuals would serve as the basis for judging the impact of the on-study pesticide applications. The self-controlled results for workers in the 3 pesticide categories did not show a significant change in pre versus post workday MDA urinary levels. Therefore, one should conclude from those results that the pesticide applications did not increase MDA levels. Instead, the authors deviated from the self-controlled results and compared post work MDA levels for those who applied glyphosate and paraquat versus those who applied glyphosate alone. There is no pre-application baseline for this comparison and pre-application levels for these two groups differed appreciably (see Table 1). The post-workday comparison is not an evaluation of the on-study work and its effect on MDA levels. It should not be interpreted to conclude that the post-work difference in MDA levels across exposure categories indicates a joint effect of glyphosate and paraquat from the on-study applications. The comparison of relevance to the study’s rationale is the self-controlled pre-work versus post-work comparison within pesticide classes. Other results showed that the (putatively protective) antioxidant enzyme GSH was not reduced for workers in any of the 3 pesticide categories. To conclude, this study did not show that glyphosate increases reactive oxygen species for pesticide workers or decreases potentially protective GSH levels. The relevance of these results for assessing glyphosate risk is uncertain.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
64	CA 8.3.1.2, CP 10.3.1.2	Motta E. V. S. et al.	2020	Impact of glyphosate on the honey bee gut microbiota: effects of intensity, duration, and timing of exposure.	mSystems (2020), Vol. 5, No. 4, pp. E00268-20	The relevance of this article is unclear (Category C) for the following reason: No endpoints are provided. Although this publication provides information about chronic impacts of glyphosate on bacteria that may be relevant at some level, it is uncertain without further guidance, how these data can be related to the EU level regulatory risk assessment (as the methods used are unrecognised) and how to interpret the data within the context of a renewal. Due to these uncertainties it has to be considered Category C with the uncertainties being the restrictions. The glyphosate formulation is not fully described. No analytical verifications of the test item concentrations in the medium were conducted. Study is not compliant with any accepted guideline and therefore validity criteria cannot be assessed. Although glyphosate was tested at different concentrations and a dose-response effect was observed in several parameters studied, no ECx assessment was performed.

Table 37: Articles of unclear relevance (category C) after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
63	Intayoung U. et al.	CA 5.9.4	2020	Effect of Occupational Exposure to Herbicides on Oxidative Stress in Sprayers.	Safety and Health at Work (2020): Ahead of print. doi.org/10.1016/j.shaw.2020.09.011	The relevance of this article is unclear (Category C) for the following reason: The underlying rationale for this study was that an increase in the urinary MDA level after a pesticide application would be indicative of a toxic effect of pesticides with potential future health consequences. In order to assess MDA levels related to an application, the authors used the collection and analysis of spot urine samples before and after a workday that involved application of either glyphosate alone (n = 52 or 56.0%), glyphosate and paraquat (n = 7 or 7.5%), or glyphosate and 2,4-D (n = 34, 36.5%). In essence, the authors were using a self-controlled pre/post study design with individuals acting as their own controls. The average difference between pre-application and post-application MDA values within the same individuals would serve as the basis for judging the impact of the on-study pesticide applications. The self-controlled results for workers in the 3 pesticide categories did not show a significant change in pre versus post workday MDA urinary levels. Therefore, one should conclude from those results that the pesticide applications did not increase MDA levels. Instead, the authors deviated from the self-controlled results and compared post work MDA levels for those who applied glyphosate and paraquat versus those who applied glyphosate alone. There is no pre-application baseline for this comparison and pre-application levels for these two groups differed appreciably (see Table 1). The post-workday comparison is not an evaluation of the on-study work and its effect on MDA levels. It should not be interpreted to conclude that the post-work difference in MDA levels across exposure categories indicates a joint effect of glyphosate and paraquat from the on-study applications. The comparison of relevance to the study's rationale is the self-controlled pre-work versus post-work comparison within pesticide classes. Other results showed that the (putatively protective) antioxidant enzyme GSH was not reduced for workers in any of the 3 pesticide categories. To conclude, this study did not show that glyphosate increases reactive oxygen species for pesticide workers or decreases potentially protective GSH levels. The relevance of these results for assessing glyphosate risk is uncertain.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
64	CA 8.3.1.2, CP 10.3.1.2	Motta E. V. S. et al.	2020	Impact of glyphosate on the honey bee gut microbiota: effects of intensity, duration, and timing of exposure.	mSystems (2020), Vol. 5, No. 4, pp. E00268-20	The relevance of this article is unclear (Category C) for the following reason: No endpoints are provided. Although this publication provides information about chronic impacts of glyphosate on bacteria that may be relevant at some level, it is uncertain without further guidance, how these data can be related to the EU level regulatory risk assessment (as the methods used are unrecognised) and how to interpret the data within the context of a renewal. Due to these uncertainties it has to be considered Category C with the uncertainties being the restrictions. The glyphosate formulation is not fully described. No analytical verifications of the test item concentrations in the medium were conducted. Study is not compliant with any accepted guideline and therefore validity criteria cannot be assessed. Although glyphosate was tested at different concentrations and a dose-response effect was observed in several parameters studied, no ECx assessment was performed.

Table 38: Articles excluded after detailed assessment (i.e. not relevant): sorted by technical section (and by author)

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
65	Ecotoxicology	Chaves A. et al.	2020	Effects of glyphosate-based herbicide on royal jelly production of Apis mellifera (Hymenoptera: Apidae) in field conditions.	JOURNAL OF APICULTURAL RESEARCH (2020): Ahead of print doi.org/10.1080/00218839.2020.1844463	The article has been classified as not relevant by full text for the following reason: This poorly described field study with honey bees was conducted in Brazil and therefore, does not deal with EU representative uses/conditions. In addition, the test item was not clearly identified, the test item purity is not stated, and the focus (royal jelly production) and design (hives without queens, for example) of the study are not relevant for the European regulatory purposes. The test substance was identified only as 'Roundup'. The surfactant system in the formulated product used in this study was not confirmed by the author. For studies conducted in Brazil, Roundup Original is occasionally used which contains POEA and is therefore not relevant to the EU as POEA is banned in the EU.
66	Ecotoxicology	de Carvalho Cruz R. et al.	2020	Glyphosate-based herbicide toxicophenomics in marine diatoms: impacts on primary production and physiological fitness.	Applied Sciences (2020), Vol. 10, No. 21, Art. No. 7391	The article has been classified as not relevant by full text for the following reason: The test design used does not reflect recognised approaches for EU level regulatory risk assessment. Furtheromore, test substance concentrations in the medium were not analytically determined. All validity criteria according to OECD TG 201 cannot be evaluated. Growth rate was determined at 48h (instead of 72h). The growth medium and the exposure phase are not clearly described. In addition, a glyphosate based formulation was tested which is not the representative formulation for the glyphosate EU renewal (the representative formulation is MON 52276).
67	Ecotoxicology	Jaiswal K. K. et al.	2020	Impact of glyphosate herbicide stress on metabolic growth and lipid inducement in Chlorella sorokiniana UUIND6 for biodiesel production.	Algal Research-Biomass Biofuels and Bioproducts (2020), Vol. 51, Art. No. 102071	The article has been classified as not relevant by full text for the following reason: The formulations used in this study contain POEA surfactant which is not permitted in formulated herbicidal products in the EU. The tested individuals were collected from a wastewater source and previous pesticide exposure cannot be excluded. No analytical verifications of the test item concentrations in the test media were conducted. The test is not conducted according to the OECD TG 201 and therefore, it is not possible to confirm whether the study meets the validity criteria. No statistical analysis was provided/conducted. In the preliminary test, behaviour of the control after 96h is not properly reported. IC50 was calculated at 96h (instead of 72h as proposed by the OECD TG 201).
68	Ecotoxicology	Khadra M. et al.	2018	Age matters: Submersion period shapes community composition of lake biofilms under glyphosate stress.	FACETS (2018), Vol. 3, pp. 934-951	The article has been classified as not relevant by full text for the following reason: This study, investigating the effects of a pulse exposure of glyphosate on the community composition and chlorophyll-a concentrations of lake biofilms at different colonization stages (2 months, 1 year, and 20 years), presents test design and system that are not relevant for the European regulatory purposes. The generated outcomes of the study

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
						(glyphosate and phosphorous concentrations, chlorophyll-a concentrations and community composition between different treatments) are not relatable to the EU level risk assessment. In addition, the publication is not dealing with EU representative conditions, although the exposure to glyphosate is under laboratory conditions, the biological community and the water were obtained from a lake in Canada. Due to the limitations of the study design reflecting a surface water exposure system specific to Canada, it is difficult to relate the findings to an EU situation from a risk assessment perspective.
69	Ecotoxicology	Pochron S. T. et al.	2021	Earthworms Eisenia fetida recover from Roundup exposure.	Applied Soil Ecology (2021), Vol. 158, Art. No. 103793	The article has been classified as not relevant by full text for the following reason: Roundup Ready to use III is a mixture of IPA salt at 2% and pelargonic acid at 2%. Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity). In addition, in this study the source of the tested earthworm is insufficiently described so previous exposure to pesticides cannot be excluded. Soil moisture was not reported and only one concentration was tested.
70	Ecotoxicology	Pompermaier A. et al.	2020	Waterborne agrichemicals compromise the anti-predatory behavior of zebrafish.	Environmental science and pollution research international (2020), Vol. 27, No. 31, pp. 38559-38567	The article has been classified as not relevant by full text for the following reason: Study design and test system in the study are not relevant for the European regulatory purposes. Exposure not confirmed, test item identity not confirmed. Fish were only exposed for 30 minutes and the outcome of anti-predator behaviour after axposure is not relevant for the European regulatory purpose / no endpoints presented that could be applied to an EU level risk assessmemnt for renewal purposes.
71	Ecotoxicology	Roques J. A. C. et al.	2020	Stress response in terrestrial isopods: A comparative study on glycaemia.	Applied Soil Ecology (2020), Vol. 156, pp. Art. No. 103708	The article has been classified as not relevant by full text for the following reason: The usefulness of this study is low as it cannot be related to a data requirement. A consequence of low active content (170 g/L) is that the amount of co-formulant applied to the carrots would have been increased, which was not assessed. The exposure is also unreaslistic with leaves and carrots soaked in solution for 15 minutes and remaining solution pipetted into the arenas, weekly for 25 days, worst case. The glucose results cannot be related. Characterization of soil (texture like sandy loam and pH) and source was not clearly described, just as moistened compost. Test conditions like temperature and humidity/soil moisture insufficiently described.There is no purity information presented in the paper and the exposure was not confirmed. The endpoints do not inform on risk assessment and is unclear how they can be used in a risk assessment. Therefore the study is not relevant.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
72	Ecotoxicology	Ruuskanen S. et al.	2020	Glyphosate-based herbicides influence antioxidants, reproductive hormones and gut microbiome but not reproduction: A long-term experiment in an avian model.	Environmental pollution (2020), Vol. 266, No. Pt 1, Art. No. 115108	The article has been classified as not relevant by full text for the following reason: The results cannot be related to the risk assessment and do not inform on population level effects and therefore not relevant. Also, the formulation tested is not relevant (Roundup Flex® - 480 g/L glyphosate, present as 588 g/L [43.8% w.w] of potassium salt of glyphosate with surfactants alkylpolyglycoside and nitrotryl).
73	Ecotoxicology	Zhao H. et al.	2020	Transcriptomic and metabolomic landscape of the molecular effects of glyphosate commercial formulation on Apis mellifera ligustica and Apis cerana cerana.	The Science of the total environment (2020), Vol. 744, Art. No. 110558	The article has been classified as not relevant by full text for the following reason: This study, dealing with the mode of action of glyphosate on bees at the molecular level (the numbers of differentially expressed genes and metabolites under glyphosate stress), presents findings based on cellular/molecular level that cannot be related to the risk assessment. The generated outcomes are not relatable to the EU level risk assessment. These effects do not necessarily proof correspondance to adverse ecotoxicological effects.
74	Ecotoxicology	Zheng T. et al.	2021	Effects of chronic glyphosate exposure on antioxdative status, metabolism and immune response in tilapia (GIFT, Oreochromis niloticus).	Comparative biochemistry and physiology, Part C (2021), Vol. 239, Art. No. 108878	The article has been classified as not relevant by full text for the following reason: This study, evaluating the chronic toxicity of glyphosate on fish (tilapia) via determining antioxidative status, metabolism, inflammation and immune response, presents findings based on cellular/molecular level that cannot be related to the risk assessment. The generated outcomes are not relatable to the EU level risk assessment. These effects do not necessarily proof correspondance to adverse ecotoxicological effects. In addition, the test item has not been identified at all.
75	Fate and behaviour in the environment	Chen L. et al.	2020	Effective glyphosate degradation through the combination of ozone/hydrogen peroxide oxidation and coagulation.	Desalination and Water Treatment (2020), Vol. 204, pp. 377-387	The article has been classified as not relevant by full text for the following reason: The article focuses on the effect of ozone and hydrogen peroxide treatment on glyphosate removal in industrial wastewater treatment of pesticide-producing industry. For the experiments, artificial colored "glyphosate-simulated wastewater" was used. No information on glyphosate analysis or concentration is reported. The article is therefore considered not relevant to the data requirement.
76	Fate and behaviour in the environment	Imfeld G. et al.	2020	Do rainfall characteristics affect the export of copper, zinc and synthetic pesticides in surface runoff from headwater catchments?	Science of the total environment (2020), Vol. 741, Art. No. 140437	The article has been classified as not relevant by full text for the following reason: Glyphosate was not the substance of concern, glyphosate was not included in the 12 pesticides analysed.
77	Fate and behaviour in the environment	Korgmaa V. et al.	2020	Removal of hazardous substances in municipal wastewater treatment plants.	Water Science & Technology (2020), Vol. 81, No. 9, pp. 1-12	The article has been classified as not relevant by full text for the following reason: The article focuses on the removal efficiency of municipal wastewater treatment plants for different pollutants, amongst them glyphosate & AMPA, and the influence of the level of complexity as well as operators' competency. No results of analysis of glyphosate or AMPA are reported. Therefore, the article is considered not relevant to the data requirements.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
78	Fate and behaviour in the environment	Kulikova N. A. et al.	2020	Monoammonium Phosphate Effects on Glyphosate in Soils: Mobilization, Phytotoxicity, and Alteration of the Microbial Community.	Eurasian Soil Science (2020), Vol. 53, No. 6, pp. 787-797	The article has been classified as not relevant by full text for the following reason: The article focuses on the amount of water-extractable glyphosate and AMPA from soils treated with glyphosate with or without addition of monoammonium phosphate. Further, the number of copies of 16S rRNA genes of bacteria was analysed to on the abundance of functional genes of bacteria responsible for glyphosate degradation. As neither degradation nor adsorption is investigated, the article is considered not relevant to the data requirements.
79	Residues in or on treated products, food and feed	Poppenga R. H. et al.	2020	Commercial and Industrial Chemical Hazards for Ruminants: An Update.	Veterinary Clinics of North America - Food Animal Practice (2020), Vol. 36, No. 3, pp. 621-639	The article has been classified as not relevant by full text for the following reason: Article only provides general information on the use of glyphosate and potential exposure of livestock to glyphosate residues. No monitoring data or any experimental data provided.
80	Residues in or on treated products, food and feed	Rebouillat P. et al.	2020	Estimated dietary pesticide exposure from plant-based foods using NMF-derived profiles in a large sample of French adults.	European Journal of Nutrition (2020): Ahead of Print. doi.org/10.1007/s00394-020-02344-8	The article has been classified as not relevant by full text for the following reason: Publication is dealing with general pesticide exposures (not glyphosate specific). Purpose of the study was to identify dietary pesticide exposure profiles from conventional and organic food. No information on direct exposure to glyphosate and no reporting of effects.
81	Toxicology and metabolism	Barukcic I.	2020	Glyphosate and non-hodgkin lymphoma: no causal relationship.	Journal of Drug Delivery and Therapeutics (2020), Vol. 10(1Suppl.), pp. 6-29	The article has been classified as not relevant by full text for the following reason: Review article - the method did not follow accepted epidemiologic practice and the methodology was very uncertain.
82	Toxicology and metabolism	Bootsikeaw S. et al.	2020	Urinary glyphosate biomonitoring of sprayers in vegetable farm in Thailand.	HUMAN AND ECOLOGICAL RISK ASSESSMENT (2020): Ahead of print doi.org/10.1080/10807039.2020.1797471	The article has been classified as not relevant by full text for the following reason: This is an exposure study conducted in Thailand. The study aimed to measure glyphosate exposure concentrations through inhalation, dermal contact, and urinary glyphosate concentrations among 43 vegetable farmers. However, use of test item is unclear - no comment on how workers in this study were exposed, neither by what test item, nor the amount, time, frequency etc. The article is lacking important information, cannot be used in risk assessment, and is therefore not relevant.
83	Toxicology and metabolism	Bozzini E.	2020	Contrasting norms on the use of evidence in risk assessment: the controversy surrounding the carcinogenicity of glyphosate.	Health, Risk & Society (2020), Vol. 22, No. 3/4, pp. 197-213	The article has been classified as not relevant by full text for the following reason: The article discusses differences in the outcome of risk assessment by IARC and EFSA using glyphosate as example. On the basis of the glyphosate case study, the article discusses advantages and shortcomings of different procedural norms for the selection and evaluation of scientific evidence, and their implications for the overall quality of risk assessments. The article is not relevant as this is an opinion article where no new data is provided that can be used for risk assessment. The article proves no new data.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
84	Toxicology and metabolism	Connolly A. et al.	2020	Human Biomonitoring of Glyphosate Exposures: State-of-the-Art and Future Research Challenges.	Toxics (2020), Vol. 8, No. 3, Art. No. 60	The article has been classified as not relevant by full text for the following reason: Review on studies that use human biomonitoring to measure urinary glyphosate and AMPA in occupationally and non-occupationally exposed population. Overall objective of the publication is to evaluate and standardise the results of the current state-of-the-art in glyphosate exposure assessment using human biomonitoring (urine samples), to evaluate the internal glyphosate concentrations to health-based guidance values, to outline the gaps in knowledge that are still required for interpretation of human biomonitoring data (human glyphosate metabolism and excretion), and to propose recommendations for sampling strategies, all of which could inform future studies investigating population exposures to glyphosate. This article is not relevant as it only provides secondary information (scientific and regulatory reviews), no correlation to glyphosate / glyphosate product and effects).
85	Toxicology and metabolism	Duke S. O.	2020	Glyphosate exposure and toxicology.	Pest Management Science (2020), Vol. 76, No. 9, pp. 2873	The article has been classified as not relevant by full text for the following reason: Editorial opinion article providing no new data. Not relevant for the risk assessment.
86	Toxicology and metabolism	Miroshnikova D. I. et al.	2019	The severity of endogenous intoxication and oxidative stress in the blood of workers in contact with glycine derivatives.	Gigiena i Sanitariya (2019), No. 8, pp. 851-856	The article has been classified as not relevant by full text for the following reason: Cross-sectional study so the temporal exposure-outcome sequence cannot be established. There was a convenience control group and apparent lack of control for potentially confounding factors. Unclear when the exposures took place relative to the study's blood collection. Duration of exposure not mentioned. A cross-sectional study, but the study design is not specified.
87	Toxicology and metabolism	Nerozzi C. et al.	2020	Effects of Roundup and its main component, glyphosate, upon mammalian sperm function and survival.	Scientific reports (2020), Vol. 10, No. 1, Art. No. 11026	The article has been classified as not relevant by full text for the following reason: Glyphosate concentration tested was not physiological (5-360 µg/mL).
88	Toxicology and metabolism	Nova P. et al.	2020	Glyphosate in Portuguese Adults - A Pilot Study.	Environmental toxicology and pharmacology (2020), Vol. 80, Art. No. 103462	The article has been classified as not relevant by full text for the following reason: Publication is dealing with general pesticide exposures (not glyphosate specific). Urine samples were collected from Portuguese adults of the general population (non occupational exposure) and investigated for the presence of GLY and AMPA. Systematically available internal dose levels were calculated retrospectively.
89	Toxicology and metabolism	Pierce J. S. et al.	2020	Pilot study evaluating inhalation and dermal glyphosate exposure resulting from simulated heavy residential consumer application of Roundup(®).	Inhalation toxicology (2020), Vol. 32, No. 8, pp. 354-367	The article has been classified as not relevant by full text for the following reason: In this study, exposure of consumer applicants to Roundup Weed & Grass Killer Super Concentrate containing 50.2% glyphosate was monitored. However, the formulation is not the AIR5 relevant formulation containing 360 g/L and the article therefore not relevant for risk assessment.

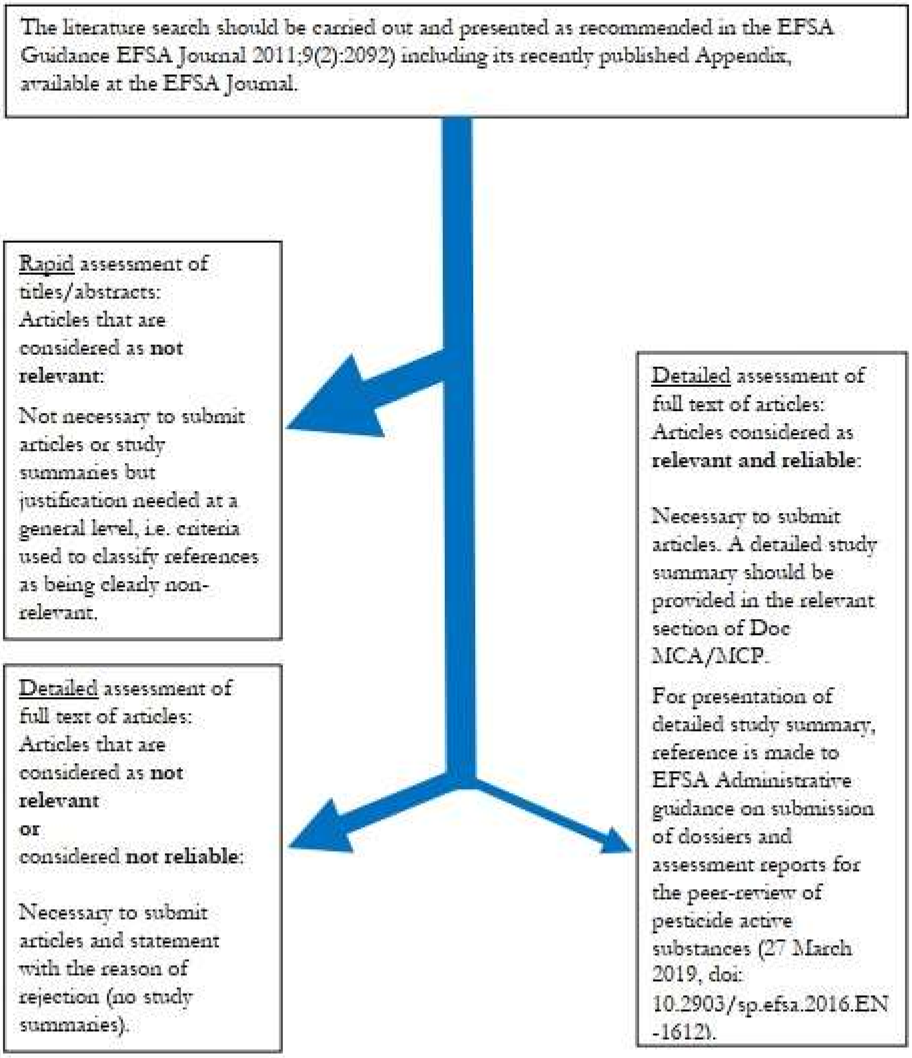
Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
90	Toxicology and metabolism	Plewis I.	2020	Pesticides and transgenerational inheritance of pathologies: Designing, analysing and reporting rodent studies.	PLoS ONE (2020) Vol. 15, No. 10, Art. No. e0228762	The article has been classified as not relevant by full text for the following reason: The article is a meta analysis of five different publications from Washington state university, analysing generational effects of pesticides (Atrazine, Vinclozolin, Methoxychlor, Permerthrin and Glyphosate) on rodents. The focus of this publication is the missing statistical analysis of litter effects within the mentioned studies.
91	Toxicology and metabolism	Rydz C. E. et al.	2020	Estimating Exposure to Three Commonly Used, Potentially Carcinogenic Pesticides (Chlorolathonil, 2,4-D, and Glyphosate) Among Agricultural Workers in Canada.	Annals of work exposures and health (2020): Ahead of print. doi: 10.1093/annweh/wxaa109	The article has been classified as not relevant by full text for the following reason: Publication is dealing with general pesticide exposures (not glyphosate specific). The study estimated exposure to 3 commonly used pesticides, among them glyphosate, in Canada's agricultural industry. No details on exposure, no reporting on effects related to pesticide exposure.
92	Toxicology and metabolism	Schaeffer J. W. et al.	2020	A pilot study to assess inhalation exposures among sugarcane workers in guatemala: Implications for chronic kidney disease of unknown origin.	International Journal of Environmental Research and Public Health (2020), Vol. 17, No. 16, Art. No. 5708	The article has been classified as not relevant by full text for the following reason: The publication was investigating the amount of glyphosate present in the environment. Monitoring without correlation to exact exposure or related effects. No information provided affecting the risk assessment.
93	Toxicology and metabolism	Ujowundu C. O. et al.	2020	Biochemical and liver histological changes in rats exposed to sub-lethal dose of Uproot-pesticide and the protective potentials of nutritional supplements.	Journal of Applied Biology & Biotechnology (2020), Vol. 8, No. 4, pp. 26-32	The article has been classified as not relevant by full text for the following reason: Intraperitoneal injection is not a preferred route of administration for an in vivo study. In addition, the publication is dealing with a glyphosate formulation Uproot containing POEA. The representative formulation for the glyphosate AIR5 does not contain POEA. POEA is banned in the EU. Thus the paper is not relevant to the EU glyphosate renewal.
94	Toxicology and metabolism / Medical data	Wijerathna T. M. et al.	2020	Cellular injury leading to oxidative stress in acute poisoning with potassium permanganate/oxalic acid, paraquat, and glyphosate surfactant herbicide.	Environmental toxicology and pharmacology (2020), Vol. 80, Art. No. 103510	The article has been classified as not relevant by full text for the following reason: This paper describes using the biomarker of CytoC in Acute Kidney Injury in patients who ingested pesticides, including 27 cases of formulated glyphosate ingestion. Surfactants are known to cause caustic injury, hemodynamic instability and shock. It is not surprising, therefore, to see patients develop AKI in this setting. Mitochondrial injury is not unusual in hypovolemic shock, the authors are exploring the use of CytoC as an early biomarker for predicting who will develop acute renal dysfunction. Since this is in the setting of overdose rather than occupational exposure, the paper is not relevant for the regulatory risk assessment.

Appendix 1: AGG ADVICE on how to present the literature search in the dossier

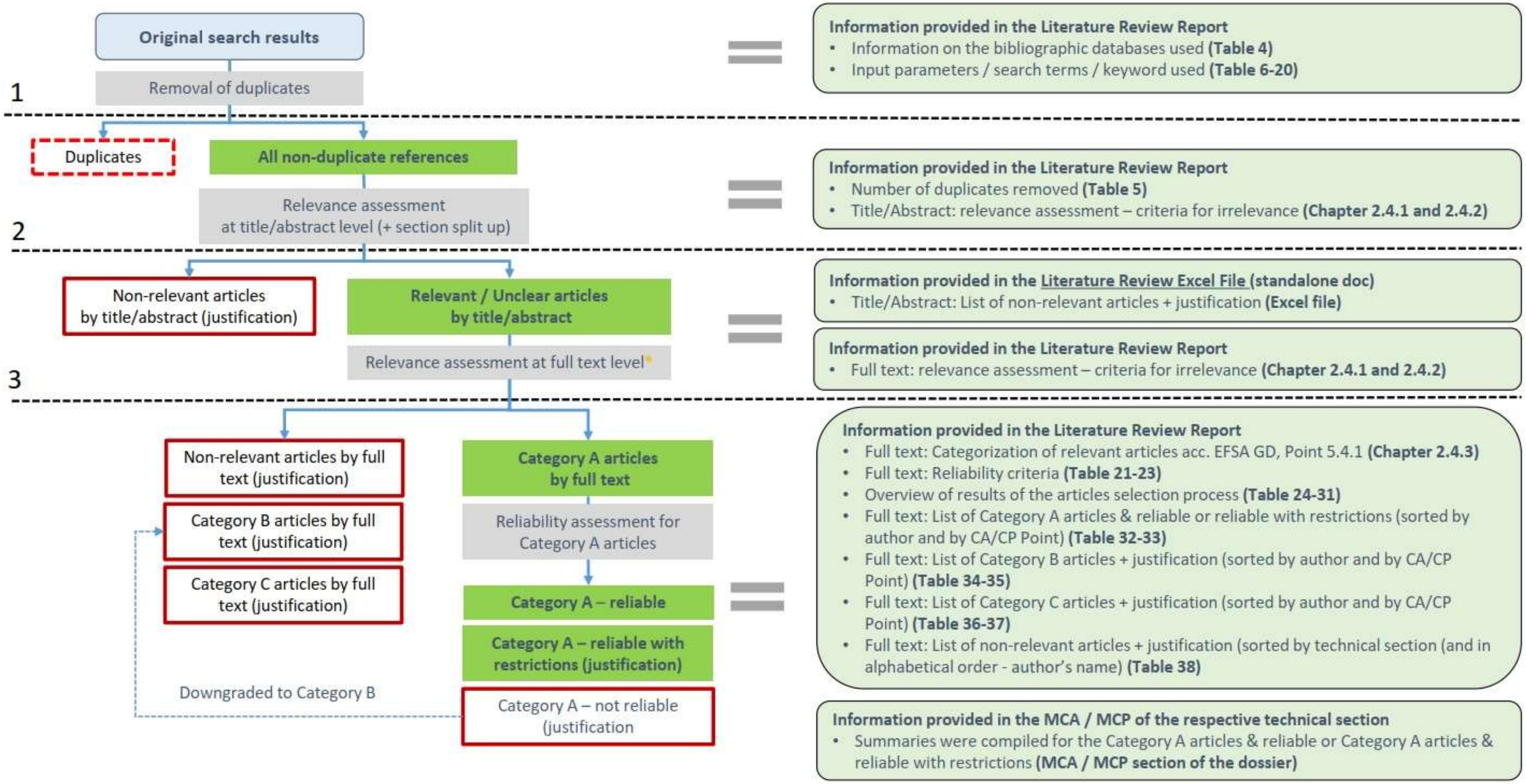
ASSESSMENT GROUP ON GLYPHOSATE (AGG)

October 2019

ADVICE TO GTF2:
HOW TO PRESENT THE LITERATURE SEARCH
IN THE DOSSIER TO BE SUBMITTED JUNE 2020



Appendix 2: The process of articles selection



* All articles (and their translations) evaluated at full-text level (detailed assessment) are submitted to the AGG.

Appendix 3: ORIGINAL SEARCH QUERY - July 2020 – December 2020

Preparing the search queries on STN:

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    FILE 'STNGUIDE' ENTERED AT 13:42:41 ON 04 JAN 2021
CHARGED TO COST=113898
L1          QUE SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
            GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
            5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
            69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
            OR 1066-51-9
            SAVE TEMP L1 GLY1/Q
L2          QUE SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
            ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
            AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
             PHOSPHONIC ACID OR 57637-97-5
            SAVE TEMP L2 GLY2/Q
L3          QUE SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
            IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
            C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
            YDROXYMETHYL OR PHOSPHONOMETHANOL
L4          QUE SPE=ON  ABB=ON  PLU=ON  HYDROXYMETHYLPHOSPHONATE OR
            HYDROXYMETHYLPHOSPHONIC ACID
L5          QUE SPE=ON  ABB=ON  PLU=ON  L3 OR L4
            SAVE TEMP L5 GLY3/Q
L6          QUE SPE=ON  ABB=ON  PLU=ON  35404-71-8 OR METHYLAMINO METHYL
            PHOSPHONIC ACID OR METHYLAMINOMETHYL PHOSPHONIC ACID OR
            METHYLAMINOMETHYLPHOSPHONIC ACID OR N METHYL AMPA OR NSC
            244826 OR PHOSPHONIC ACID METHYLAMINO METHYL OR PHOSPHONIC
            ACID P METHYLAMINO METHYL
L7          QUE SPE=ON  ABB=ON  PLU=ON  2 3 DIHYDROXY 1 OXOPROPYL AMINOMETH
            YL PHOSPHONIC ACID OR 2 3 DIHYDROXY 1 OXOPROPYL AMINOMETHYLPHOS
            PHONIC ACID OR N GLYCERYL AMPA
L8          QUE SPE=ON  ABB=ON  PLU=ON  3 OXO 3 PHOSPHONOMETHYL AMINO
            PROPANOIC ACID OR 3 OXO 3 PHOSPHONOMETHYL AMINOPROPANOIC ACID
            OR N MALONYL AMPA
L9          QUE SPE=ON  ABB=ON  PLU=ON  993-13-5 OR DIHYDROGEN METHYLPHOSPH
            ONATE OR METHANEPHOSPHONIC ACID OR METHYL PHOSPHONIC ACID OR
            METHYLPHOSPHONIC ACID OR NSC 119358 OR PHOSPHONIC ACID METHYL
            OR PHOSPHONIC ACID P METHYL
L10         QUE SPE=ON  ABB=ON  PLU=ON  (L6 OR L7 OR L8 OR L9)
            SAVE TEMP L10 GLY4/Q
L11         QUE SPE=ON  ABB=ON  PLU=ON  24569-83-3 OR 2 METHYL PHOSPHONOMET
            HYL AMINO ACETIC ACID OR 2 METHYL PHOSPHONOMETHYL AMINOACETIC
            ACID OR ACETIC ACID 2 N METHYL N PHOSPHONATOMETHYL AMINO OR
            GLYCINE N METHYL N PHOSPHONOMETHYL OR GLYPHOSATE N METHYL OR
            METHYL GLYPHOSATE
L12         QUE SPE=ON  ABB=ON  PLU=ON  METHYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR METHYL PHOSPHONOMETHYL AMINOACETIC ACID OR N
            METHYL N PHOSPHONOMETHYL GLYCINE OR N METHYLGLYPHOSATE OR N
            PHOSPHONOMETHYL N METHYL GLYCINE OR N PHOSPHONOMETHYL N
            METHYLGLYCINE
L13         QUE SPE=ON  ABB=ON  PLU=ON  (L11 OR L12)
            SAVE TEMP L13 GLY5/Q
L14         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
            HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
            IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
            EYE? OR IRRIT? OR SENSI? OR ALLERG?
L15         QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
            GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
            METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
            ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L16         QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
            CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
            OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
            OR HORMON? OR GONAD? OR DISRUPT?
L17         QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
            MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
            PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
            EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
            OCCUPAT?
L18         QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
            MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
            CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
            RISK ASSESSMENT?
L19         QUE SPE=ON  ABB=ON  PLU=ON  (L14 OR L15 OR L16 OR L17 OR L18)
            SAVE TEMP L19 TOX/Q
L20         QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
            OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
            METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
            MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L21         QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
            PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
            HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
            OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L22         QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
            OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L23         QUE SPE=ON  ABB=ON  PLU=ON  (L20 OR L21 OR L22)
            SAVE TEMP L23 RES/Q
L24         QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
            DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
            SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
            AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L25         QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
             OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
            OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
            ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L26         QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
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          PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
          HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
          MOVEMENT OR REMOVAL OR DRINKING WATER OR WATER TREATMENT
          PROCESSES
L27         QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
          NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
          OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
          OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
          PERSISTENCE OR LIGAND
L28         QUE SPE=ON  ABB=ON  PLU=ON  (L24 OR L25 OR L26 OR L27)
          SAVE TEMP L28 FATE/Q
L29         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
          ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
          BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
          EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT? OR BIODIVERS? OR
          PROTECTION GOALS OR ECO?
L30         QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
          OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
          OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
          OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
          OR ALG? OR CHIRON?
L31         QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
          LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
          INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
          APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L32         QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L33         QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
          FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
          RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
          ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
          PARASITOID
L34         QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
          OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
          OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
          MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
          NITROGEN
L35         QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
          SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
          ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
          OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
L36         QUE SPE=ON  ABB=ON  PLU=ON  (L29 OR L30 OR L31 OR L32 OR L33
          OR L34 OR L35)
          SAVE TEMP L36 ECO/Q

SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 13:58:53 ON 04 JAN 2021
```

Final search - Update Jan 2021:

```
   FILE 'MEDLINE' ENTERED AT 15:45:08 ON 05 JAN 2021
CHARGED TO COST=113898
L1      4440 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L2       238 SEA SPE=ON  ABB=ON  PLU=ON  L1 AND ED>20200702
L3       237 SEA SPE=ON  ABB=ON  PLU=ON  L2 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE TEMP L3 GLYMEDL/A

   FILE 'AGRICOLA' ENTERED AT 15:50:40 ON 05 JAN 2021
CHARGED TO COST=113898
L4      7335 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L5       125 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND ED>20200702
L6       125 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE TEMP L6 GLYAGRI/A

   FILE 'BIOSIS' ENTERED AT 15:53:45 ON 05 JAN 2021
CHARGED TO COST=113898
L7     11508 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L8       348 SEA SPE=ON  ABB=ON  PLU=ON  L7 AND ED>20200702
L9       291 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE TEMP L9 GLYBIOS/A

   FILE 'CABA' ENTERED AT 15:57:07 ON 05 JAN 2021
CHARGED TO COST=113898
L10    19085 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L11      470 SEA SPE=ON  ABB=ON  PLU=ON  L10 AND ED>20200702
L12      470 SEA SPE=ON  ABB=ON  PLU=ON  L11 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE TEMP L12 GLYCABA/A

   FILE 'FSTA' ENTERED AT 15:59:47 ON 05 JAN 2021
CHARGED TO COST=113898
L13      552 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L14       38 SEA SPE=ON  ABB=ON  PLU=ON  L13 AND ED>20200702
L15       37 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
          T
          SAVE TEMP L15 GLYFSTA/A
```

```
   FILE 'PQSCITECH' ENTERED AT 16:02:13 ON 05 JAN 2021
CHARGED TO COST=113898
L16       5521 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
               GLY4/Q OR GLY5/Q
L17         95 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND ED>20200702
L18         95 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
               OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
               T
               SAVE TEMP L18 GLYPQSCI/A

   FILE 'TOXCENTER' ENTERED AT 16:11:40 ON 05 JAN 2021
CHARGED TO COST=113898
L19      17115 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
               GLY4/Q OR GLY5/Q
L20        676 SEA SPE=ON  ABB=ON  PLU=ON  L19 AND ED>20200702
L21        593 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
               OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
               T
               SAVE TEMP L21 GLYTOXC/A

   FILE 'EMBASE' ENTERED AT 16:20:46 ON 05 JAN 2021
CHARGED TO COST=113898
L22       5962 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
               GLY4/Q OR GLY5/Q
L23        206 SEA SPE=ON  ABB=ON  PLU=ON  L22 AND ED>20200702
L24        204 SEA SPE=ON  ABB=ON  PLU=ON  L23 NOT (COMMENT? OR DISSERTATION
               OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
               T
               SAVE TEMP L24 GLYEMBA/A

   FILE 'ESBIOBASE' ENTERED AT 16:26:21 ON 05 JAN 2021
CHARGED TO COST=113898
L25       5219 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
               GLY4/Q OR GLY5/Q
L26        201 SEA SPE=ON  ABB=ON  PLU=ON  L25 AND ED>20200702
L27        200 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
               OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
               T
               SAVE TEMP L27 GLYESBIO/A

   FILE 'HCAPLUS' ENTERED AT 16:38:29 ON 05 JAN 2021
CHARGED TO COST=113898
L28      29905 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
               GLY4/Q OR GLY5/Q
L29        745 SEA SPE=ON  ABB=ON  PLU=ON  L28 AND ED>20200702
L30        504 SEA SPE=ON  ABB=ON  PLU=ON  L29 NOT (COMMENT? OR DISSERTATION
               OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
               T
               SAVE TEMP L30 GLYHCAP/A

   FILE 'SCISEARCH' ENTERED AT 16:42:42 ON 05 JAN 2021
CHARGED TO COST=113898
L31      12468 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
               GLY4/Q OR GLY5/Q
L32        543 SEA SPE=ON  ABB=ON  PLU=ON  L31 AND ED>20200702
L33        541 SEA SPE=ON  ABB=ON  PLU=ON  L32 NOT (COMMENT? OR DISSERTATION
               OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/D
               T
               SAVE TEMP L33 GLYSCIS/A

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 16:47:56 ON 05 JAN 2021
CHARGED TO COST=113898
L34       1797 DUP REM L3 L6 L9 L12 L15 L18 L21 L24 L27 L30 L33 (1500 DUPLICAT
                  ANSWERS '1-236' FROM FILE MEDLINE
                  ANSWERS '237-361' FROM FILE AGRICOLA
                  ANSWERS '362-577' FROM FILE BIOSIS
                  ANSWERS '578-964' FROM FILE CABA
                  ANSWERS '965-987' FROM FILE FSTA
                  ANSWERS '988-1034' FROM FILE PQSCITECH
                  ANSWERS '1035-1297' FROM FILE TOXCENTER
                  ANSWERS '1298-1370' FROM FILE EMBASE
                  ANSWERS '1371-1412' FROM FILE ESBIOBASE
                  ANSWERS '1413-1579' FROM FILE HCAPLUS
                  ANSWERS '1580-1797' FROM FILE SCISEARCH
               SAVE L34 GLY202101/A
L35       1437 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND TOX/Q
               SAVE TEMP L35 GLYTOX/A
L36       1581 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND RES/Q
               SAVE TEMP L36 GLYRES/A
L37       1062 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND FATE/Q
               SAVE TEMP L37 GLYFATE/A
L38       1676 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND ECO/Q
               SAVE TEMP L38 GLYECO/A
L39       1781 SEA SPE=ON  ABB=ON  PLU=ON  (L35 OR L36 OR L37 OR L38)
               SAVE L39 GLY202101FIN/A

SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 18:07:02 ON 05 JAN 2021
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Literature Review Report

Scientific peer-reviewed open literature covering the publication period of January 2021 to 14 May 2021 for the approval of pesticide active substance glyphosate and metabolites

as under Article 8(5) of Regulation (EC) No 1107/2009

(Ref. EFSA Journal 2011; 9(2) 2092)

Report number

113898-CA9-3

Author

Anonymous, 2022

Sponsor

[redacted]

Reporting Date

28 April 2022

Date of search(es):

14 May 2021

Content

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Disclaimer

The information contained herein has been obtained from sources believed to be the most reliable. Every effort has been made to ensure completeness of data. However, no database search can be completely comprehensive, and it is possible that relevant documents have been omitted.

All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

1 Summary

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document (GD) - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances"*.

In addition, a recommendation by the Assessment Group on Glyphosate (AGG)[5] on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 64) for more details.

This Literature Review Report summarizes the search and evaluation of the glyphosate scientific peer-reviewed open literature covering the publication period of January 2021 to 14 May 2021 and is supplementary to the previous searches covering the publication period of January 2010 to December 2020.[6]

The literature search was conducted accessing 11 bibliographic databases via the service provider STN.

In total, 597 articles were identified upon removal of duplicates within the current search (January 2021 to 14 May 2021) and articles found already in the previous searches (January 2010 to December 2020).

All 597 articles were subsequently assessed for their relevance at title/abstract level ("rapid assessment" according to the procedure and requirements stated in the EFSA 2092 GD).

A total of 523 of the 597 articles were identified as "non-relevant" in the rapid assessment (e.g. publications dealing with chemical synthesis, efficacy, analytical methods or publications which are not related to glyphosate or its metabolites) and excluded from further evaluation. Due to the large quantity of data, and as agreed with the AGG, the list of articles and the justification for their non-relevance is provided in a standalone Literature Review Excel File (Document ID: 113898_CA9-3_Literature Review Excel File).

For the remaining 74 articles, identified as potentially "relevant" or of "unclear relevance" in the rapid assessment, the full-text documents[7] were reviewed in detail ("detailed assessment").

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[1] (aminomethyl)phosphonic acid (AMPA), N-acetyl-AMPA, N-acetyl-glyphosate, (hydroxymethyl)phosphonic acid (HMPA), N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA, methylphosphonic acid and N-methylglyphosate.
[2] European Food Safety Authority, 2011: *Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) No 1107/2009.* EFSA Journal 2011;9(2):2092. 49 pp, doi:10.2903/j.efsa.2011.2092.
[3] Appendix to EFSA Journal 2011;9(2):2092. *Further guidance on performing and presenting the literature search.* Available online: https://efsa.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.2903/j.efsa.2011.2092&file=efs22092-sup-0001-Appendix.pdf
[4] European Food Safety Authority, 2019. *Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances.* EFSA supporting publication 2019:EN-1612. 49 pp., doi:10.2903/sp.efsa.2019.EN-1612.
[5] On 10th May 2019, the European Commission appointed four Member States (France, Hungary, the Netherlands and Sweden) to act jointly as 'rapporteurs' for the AIR5 process assessment of glyphosate. This group of Member States is known as the Assessment Group on Glyphosate (AGG).
[6] See Literature Review Reports 108689-CA9-1, 113898-CA9-1 and 113898-CA9-2 for more details.
[7] All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

A total of 28 articles of the remaining 74 articles were identified as “non-relevant” in the detailed assessment and were excluded from further evaluation. The list of the articles and the justification for their non-relevance is provided in **Table 38** of this Literature Review Report document.

The remaining 46 articles of the 74 articles were identified as “relevant” in the detailed assessment and were classified according to the EFSA 2092 GD (EFSA Journal 2011;9(2):2092, Point 5.4.1).

Category A Articles which provide data for establishing or refining risk assessment parameters.
For all articles of Category A, a reliability assessment was performed as recommended in the EFSA 2092 GD. In addition, summaries were compiled for Category A articles classified as “reliable” or “reliable with restrictions”. The list of these Category A & reliable / reliable with restrictions articles can be found in **Table 32** and **Table 33** of this Literature Review Report document.

Category B Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
A justification for such decision is provided as recommended in the EFSA 2092 GD. The list of these Category B articles and the justifications can be found in **Table 34** and **Table 35** of this Literature Review Report document.

Category C Articles for which relevance cannot be clearly determined.
As recommended in the EFSA 2092 GD, an explanation is provided why the relevance could not be determined. The list of these Category C articles and the explanations can be found in **Table 36** and **Table 37** of this Literature Review Report document.

The full outcome of the literature evaluation is provided in **Table 1**.

Table 1: Summary of the literature review

Section	**Number of articles found**	**Rapid assessment (title/abstract level)**		**Detailed assessment (full-text level)**	
		non-relevant articles	**potentially relevant / unclear relevance**	**non-relevant articles**	**relevant articles (Category A+B+C)**
Efficacy / Agronomy [a)]	248	248	n.a.	n.a.	n.a.
Analytical methods [a)]	29	29	n.a.	n.a.	n.a.
Other non-relevant categories [b)]	54	54	n.a.	n.a.	n.a.
Ecotoxicology	93	61	32	19	13
E-fate	79	74	5	1	4
Residues	18	10	8	3	5
Toxicology	76	47	29	5	24
Total	**597**	**523**	**74**	**28**	**46**

[a)] Efficacy / Agronomy (e.g. reporting desired effects on organisms to be controlled) and development of analytical methods (artificial measurements) do not provide information useful/required for the environmental or human safety risk assessment.
[b)] The category "other non-relevant categories" covers a wide range of scientific publications which are not related to glyphosate or its metabolites or are not related to exposure of humans or the environment to glyphosate or its metabolites and thus not relevant for the risk assessments.

The full outcome of the relevant articles after detailed (full-text) assessment is provided in **Table 2**.

Table 2: Relevant articles by full-text classified according to the EFSA 2092 GD, Point 5.4.1

	Relevant articles by full-text (EFSA 2092 GD, Point 5.4.1)		
Section	**Category A [a)]**	**Category B [b)]**	**Category C [c)]**
Ecotoxicology	3	8	2
E-fate	3	1	0
Residues	0	5	0
Toxicology	4	15	5
Total	**10**	**29**	**7**

[a)] Category A: Articles which provide data for establishing or refining risk assessment parameters.
[b)] Category B: Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
[c)] Category C: Articles for which relevance cannot be clearly determined.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

Please refer to **Appendix 2** (page 65) to see the article selection process in detail.

2 Introduction

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA Supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

In addition, a recommendation by the Assessment Group on Glyphosate (AGG) on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 64) for more details.

In June 2020, a Literature Review Report (Document ID: 108689-CA9-1) summarizing results of the search of the glyphosate scientific peer-reviewed open literature published from January 2010 to December 2019 was submitted to the AGG as part of the glyphosate AIR5 dossier. In July 2020 during the dossier completeness check (point 23)[8], the AGG requested a top-up search for glyphosate open literature covering the publication period of January 2020 to June 2020. In October 2020, a Literature Review Report (Document ID: 113898-CA9-1) summarizing results of this top-up search was submitted to the AGG.

Furthermore, two additional supplementary literature searches of the glyphosate scientific peer-reviewed open literature were performed in January 2021 and in May 2021. The first search, from January 2021, covers the publication period of July 2020 to December 2020 and is summarized in the Literature Review Report Document ID: 113898-CA9-2. The second search, from May 2021, covers the publication period of January 2021 to 14 May 2021 and is summarized in this Literature Review Report (Document ID: 113898-CA9-3). Details for this search are provided below.

The search has been conducted via the online service provider STN (www.stn-international.de) that provides access to a broad range of databases and to published research, journal literature, patents, structures, sequences, properties, and other data.

To offer a comprehensive literature search covering the requirements of the EFSA 2092 GD eleven databases have been used: AGRICOLA, BIOSIS, CABA, HCAPLUS, EMBASE, ESBIOBASE, MEDLINE, TOXCENTER, FSTA, PQSCITECH, and SCISEARCH.

Please refer to **Table 3** for more details on the literature search.

[8] AGG's letter dated 10-July-2020, subject "Glyphosate: Check of completeness of the supplementary dossier for renewal of approval under Commission Implementing Regulation (EU) No 844/2012", section 2: Elements to be submitted in accordance with Article 11(5) of Regulation (EU) No 844/2012, point 23.

Table 3: Overview of the search conducted for glyphosate and its metabolites

Performed for	Covering publication period	Conducted on
Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	January 2021 – 14 May 2021	14 May 2021

AMPA = (aminomethyl)phosphonic acid
HMPA = (hydroxymethyl)phosphonic acid

A "focused search for grouped data requirements"[9] have been performed (a combination of a substance basic input parameters, keywords and "search filters" defined for the four technical sections – toxicology, residues, environmental fate, and ecotoxicology).

Please refer to **Chapter 2.2** and **2.3** (pages 14 and 16) for the input parameters, keywords and search filters used in the literature search.

Regarding details on the bibliographic databases used in the literature search, please refer to **Chapter 2.1** (**Table 4**).

Regarding the number of articles retrieved in the literature search, please refer to **Chapter 2.1** (**Table 5**).

For the relevance and reliability assessment, please refer to **Chapter 2.4** and **2.5** (pages 19 and 22).

For the full outcome of the literature search and for the individual technical sections, please refer to **Chapter 3** (page 27).

[9] Citation from the EFSA 2092 Guidance Document: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

2.1 Bibliographic databases used in the literature search

Table 4: Overview of the databases used in the literature search

Data requirement(s) captured in the search	**Details of the search(es)**			
	1. AGRICOLA	**2. BIOSIS**	**3. CABA**	**4. HCAPLUS**
Justification for choosing the source:	Provides literature from agriculture and related fields, e.g. biology, biotechnology, botany, ecology etc.	Provides the most comprehensive and largest life science literature, e.g. biosciences, biomedicine etc.	Provides literature from agriculture and related sciences, e.g. biotechnology, forestry, veterinary medicine etc.	Provides literature from chemistry and related fields, e.g. biochemistry, chemical engineering etc.
Number of records in the database at the time of search:	> 7.1 million (09/2020)	> 27.8 million (04/2019)	> 9.9 million (09/2020)	> 57.0 million (01/2022)
Database update:	Monthly	Weekly	Weekly	Daily updates bibliographic data; weekly updates indexing data
Date of the search:	14 May 2021	14 May 2021	14 May 2021	14 May 2021
Database covers records:	1970-present	1926-present	1973-present	1907-present and more than 180,000 pre-1907
Date of the latest database update:	6 May 2021	12 May 2021	12 May 2021	13 May 2021
Language limit:	No	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	264	258	467	343

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	**Details of the search(es)**		
	5. MEDLINE	**6. EMBASE**	**7. TOXCENTER**
Justification for choosing the source:	Provides literature from every area of medicine.	Provides literature from biomedicinal and pharmaceutical fields, e.g. bioscience, biochemistry, human medicine, forensic science, paediatrics, pharmacy, pharmacology, drug therapy, psychiatry, public health, biomedical engineering, environmental science.	Provides literature on pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals.
Number of records in the database at the time of search:	> 33.5 million (01/2022)	> 34.3 million (08/2018)	> 16.2 million (01/2022)
Database update:	Six times each week, with an annual reload	Daily	Weekly
Date of the search:	14 May 2021	14 May 2021	14 May 2021
Database covers records:	1946-present	1974-present	1907-present
Date of the latest database update:	13 May 2021	13 May 2021	10 May 2021
Language limit:	No	No	No
Document types <u>excluded</u> that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.		
Total number of records retrieved:	181	127	383

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	Details of the search(es)			
	8. FSTA	**9. PQSCITECH**	**10. ESBIOBASE**	**11. SCISEARCH**
Justification for choosing the source:	Provides literature on scientific and technological aspects of the processing and manufacture of human food products, e.g. biotechnology, hygiene and toxicology, engineering etc.	Provides a valuable and huge resource of literature (merge of 25 STN databases) from all science areas and technology; from engineering to lifescience.	Provides comprehensive literature on entire spectrum of biological and biosciences research, e.g. microbiology, biotechnology, ecological & environmental sciences, genetics, plant and crop science, toxicology and many more.	Provides one of the largest multidisciplinary scientific literature covering a broad field of sciences, technology, and biomedicine.
Number of records in the database at the time of search:	> 1.59 million (09/2020)	> 33.6 million (01/2021)	> 9.0 million (01/2021)	> 47.7 million (08/2019)
Database update:	Weekly	Monthly	Weekly	Weekly
Date of the search:	14 May 2021	14 May 2021	14 May 2021	14 May 2021
Database covers records:	1969-present	1962-present	1994-present	1974-present
Date of the latest database update:	14 May 2021	29 Apr 2021	12 May 2021	10 May 2021
Language limit:	No	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	30	74	162	354

Table 5: Total number of articles retrieved

Scope of the search	After automatic removal of duplicates within the databases in the current search (Jan 2021 – 14 May 2021)	After applying search filters [a] within the current search (Jan 2021 – 14 May 2021)	After manual removal of duplicates [b] within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020) [c]
Jan 2021 – 14 May 2021 Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	**1522**	**1517**	**597**

[a] Search filters applied for the four technical sections (residues, environmental fate, toxicology and ecotoxicology). Please refer to **Chapter 2.3** for more details (page 16).

[b] Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[c] Please refer to the Literature Review Report (LRR) 108689-CA9-1, 113898-CA9-1, and 113898-CA9-2.

Note: LRR 108689-CA9-1 covers the publication period of 1 January 2010 to 31 December 2019, LRR 113898-CA9-1 covers the publication period of 1 January 2020 to 30 June 2020, and LRR 113898-CA9-2 covers the publication period of 1 July 2020 to 31 December 2020.

2.2 Input parameters used in the literature search

The basic input parameters used in the literature search, e.g. IUPAC, chemical name or CAS number, are provided in **Table 6 - Table 15**.

Table 6: Input parameters – active substance Glyphosate

Substance name	Glyphosate Salts: isopropylamine, potassium, ammonium, methylmethanamine
IUPAC / CA name	2-(phosphonomethylamino)acetic acid
CAS number(s)	1071-83-6 Salts: 38641-94-0, 70901-12-1, 39600-42-5, 69200-57-3, 34494-04-7, 114370-14-8, 40465-66-5, 69254-40-6

Table 7: Input parameters – metabolite AMPA

Substance name	AMPA
IUPAC / CA name	(aminomethyl)phosphonic acid
CAS number(s)	1066-51-9

Table 8: Input parameters – metabolite N-acetyl glyphosate

Substance name	N-acetyl glyphosate
IUPAC / CA name	N-acetyl-N-(phosphonomethyl)glycine
CAS number(s)	129660-96-4

Table 9: Input parameters – metabolite N-acetyl AMPA

Substance name	N-acetyl AMPA
IUPAC / CA name	[(acetylamino)methyl]phosphonic acid
CAS number(s)	57637-97-5

Table 10: Input parameters – metabolite HMPA

Substance name	HMPA
IUPAC / CA name	(hydroxymethyl)phosphonic acid
CAS number(s)	2617-47-2

Table 11: Input parameters – metabolite N-methyl AMPA

Substance name	N-methyl AMPA
IUPAC / CA name	[(methylamino)methyl]phosphonic acid
CAS number(s)	35404-71-8

Table 12: Input parameters – metabolite N-glyceryl AMPA

Substance name	N-glyceryl AMPA
IUPAC / CA name	(2,3-dihydroxypropanoylamino)methylphosphonic acid
CAS number(s)	No data

Table 13: Input parameters – metabolite N-malonyl AMPA

Substance name	N-malonyl AMPA
IUPAC / CA name	3-oxo-3-(phosphonomethylamino)propanoic acid
CAS number(s)	no data

Table 14: Input parameters – metabolite methylphosphonic acid

Substance name	methylphosphonic acid
IUPAC / CA name	methylphosphonic acid
CAS number(s)	993-13-5

Table 15: Input parameters – metabolite N-methylglyphosate

Substance name	N-methylglyphosate
IUPAC / CA name	2-[methyl(phosphonomethyl)amino]acetic acid
CAS number(s)	24569-83-3

2.3 Keywords and search filters used in the literature search

The approach used for the search was the "focused search for grouped data requirements"[10], which combines the active substance and metabolite basic input parameters, keywords and search filters defined for each technical section. Please refer to **Table 16** for more details on the keywords used and to **Table 17** - **Table 20** for the search filters.

Table 16: Keywords used for the active substance glyphosate and its metabolites

Gly1: Glyphosate and AMPA	glyphosat? OR glifosat? OR glyfosat? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR 69254-40-6 OR aminomethyl phosphonic OR aminomethylphosphonic OR 1066-51-9
Gly2: N-acetyl glyphosate and N-acetyl AMPA	2 acetyl phosphonomethyl amino acetic acid OR n acetyl glyphosate OR n acetylglyphosate OR n acetyl n phosphonomethyl glycine OR 129660-96-4 OR n acetyl ampa OR acetylamino methyl phosphonic acid OR acetylaminomethyl phosphonic acid OR 57637-97-5
Gly 3: HMPA	2617-47-2 OR hydroxymethanephosphonic acid OR hydroxymethyl phosphonate OR hydroxymethylphosphonate OR hydroxymethyl phosphonic acid OR hydroxymethylphosphonic acid OR methanehydroxyphosphonic acid OR phosphonic acid(1w)hydroxymethyl OR phosphonomethanol
Gly 4: N-methyl AMPA	35404-71-8 OR methylamino methyl phosphonic acid OR methylaminomethyl phosphonic acid OR methylaminomethylphosphonic acid OR n methyl ampa OR nsc 244826 OR phosphonic acid methylamino methyl OR phosphonic acid p methylamino methyl
Gly 4: N-glyceryl AMPA	2 3 dihydroxy 1 oxopropyl aminomethyl phosphonic acid OR 2 3 dihydroxy 1 oxopropyl aminomethylphosphonic acid OR n glyceryl ampa
Gly 4: N-malonyl AMPA	3 oxo 3 phosphonomethyl amino propanoic acid OR 3 oxo 3 phosphonomethyl aminopropanoic acid OR n malonyl ampa
Gly 4: methylphosphonic acid	993-13-5 OR dihydrogen methylphosphonate OR methanephosphonic acid OR methyl phosphonic acid OR methylphosphonic acid OR nsc 119358 OR phosphonic acid methyl OR phosphonic acid p methyl
Gly 5: N-methylglyphosate (NMG)	24569-83-3 OR 2 methyl phosphonomethyl amino acetic acid OR 2 methyl phosphonomethyl aminoacetic acid OR acetic acid 2 n methyl n phosphonatomethyl amino OR glycine n methyl n phosphonomethyl OR glyphosate n methyl OR methyl glyphosate OR methyl phosphonomethyl amino acetic acid OR methyl phosphonomethyl aminoacetic acid OR n methyl n phosphonomethyl glycine OR n methylglyphosate OR n phosphonomethyl n methyl glycine OR n phosphonomethyl n methylglycine

(1w) = proximity operator (this order, up to 1 word between)
AND / OR / NOT = boolean search operators
? = any character(s)

[10] Citation from the EFSA 2092 GD: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

Table 17: Search filters related to the technical section toxicology

Toxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR hazard? OR adverse OR health OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR in vivo OR in vitro OR invivo OR invitro OR mode of action OR skin? OR eye? OR irrit? OR sensi? OR allerg? OR rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR metabolism OR metabolite? OR metabolic OR distribution OR adsorption OR excretion OR elimination OR kinetic OR cytochrome OR enzym? OR gen? OR muta? OR chromos? OR clastogen? OR DNA OR carcino? OR cancer? OR tumor? OR tumour? OR oncog? OR oncol? OR malign? OR immun? OR neur? OR endocrin? OR hormon? OR gonad? OR disrupt? OR reproduct? OR development? OR malform? OR anomal? OR fertil? OR foet? OR fet? OR matern? OR pregnan? OR embryo? OR epidem? OR medical? OR poison? OR exposure OR operator? OR bystander? OR resident? OR worker? OR occupat? biomonitoring OR human exposure OR microbiome OR oxidative stress OR apoptosis OR necrosis OR cytotoxicity OR Polyoxyethyleneamine OR POEA OR surfactant OR risk assessment?

Table 18: Search filters related to the technical section residues

Residues [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
uptake OR translocation OR rumen OR storage stability OR storage OR stability OR metabolic OR metabolism OR breakdown OR nature of residues OR residue? OR magnitude of residues OR process? OR effects of processing OR dessicant OR preharvest OR preemerg? OR ?resistant? OR ?toleran? OR transgenic OR hydroly? OR rotation? OR succeed? OR plant? OR crop? OR feed? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig? OR dietary OR assessment OR risk assessment OR consum? OR exposure

Table 19: Search filters related to the technical section environmental fate

Environmental fate [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
soil OR water OR sediment OR degradat? OR photo? OR soil residues OR soil accumulat? OR soil contaminat? OR mobility OR sorption OR column leaching OR aged residue OR leach? OR lysimeter OR groundwater OR contaminat? OR microb? OR exudation OR rhizosphere OR dissipation OR saturated zone OR hydrolysis OR drift OR run-off OR runoff OR drainage OR volat? OR atmosphere OR long-range transport OR short-range transport OR transport OR micronutrient OR phosphate OR iron OR manganese OR half-life OR halflife OR half-lives OR halflives OR DT50 OR kinetics OR off-site movement OR removal OR drinking water OR water treatment processes OR atmospheric deposition OR tile-drains OR surface water OR monitoring data OR disinfectant OR ozone OR tillage OR infiltration OR hard surface OR rainwater OR rain water OR chelat? OR complex? OR mineralization OR persistence OR ligand

Table 20: Search filters related to the technical section ecotoxicology

Ecotoxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR ecotox? OR ?toxic OR ?toxicity OR hazard OR adverse OR endocrine disrupt? OR bioaccumulate? OR biomagnifi? OR bioconcentration OR poison OR effect OR indirect effect? OR direct effect? OR biodivers? OR protection goals OR eco? OR impact OR population OR community OR wildlife OR incident OR wildlife OR incident OR pest OR bird? OR acute OR chronic OR long-term OR mallard OR duck OR quail OR bobwhite OR Anas? OR Colinus? OR wild OR dietary OR aquatic OR fish OR daphni? OR alg? OR chiron? OR sediment dwell? OR benthic OR lemna OR marin? OR estuarine OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR plant AND submerge? OR emerge? OR bee? OR apis OR apidae OR bumble? OR colony OR hive OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR protection OR model? OR vole OR pest OR arthropod? OR beneficials OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR decompos? OR micro organisms OR microorganisms OR microbial OR carbon OR nitrogen OR plant? OR vegetative vigo? OR seedling OR germination OR monocot? OR dicot? OR sewage OR activated sludge OR biodegrad? OR bioaccumulation? OR amphib? OR reptile? OR aquatic plant OR beneficial

2.4 Relevance assessment

After removal of duplicates, the remaining articles were assessed for their relevance. First, at "title / abstract level" (so-called "rapid assessment") and second, at "full-text level" (so called "detailed assessment").
Articles that were identified as "non-relevant" in the rapid assessment were excluded from further evaluation and a justification for their non-relevance was provided.
For articles that were not excluded in the rapid assessment (potentially relevant articles and articles of an unclear relevance) a detailed relevance assessment of a full-text document was performed.
Articles that were identified as "non-relevant" in the detailed assessment were excluded from further evaluation and a justification for their non-relevance was provided.

For both assessments (rapid and detailed) the same criteria for non-relevance were applied (see **Chapter 2.4.1** and **2.4.2**).

2.4.1 Criteria applied for "non-relevance"

Articles identified as "non-relevant" in the rapid and detailed assessments belong to one of the following categories and were excluded from further evaluation. A justification for their non-relevance was provided.

- Publications related to efficacy (resistance related articles, new uses of control of pest / crops) or to agricultural / biological research (crop science, breeding, fertilization, tillage, fundamental plant physiology / micro- / molecular biology).
- Publications dealing with analytical methods / development.
- Publications describing new methods of synthesis (discovery / developments) or other aspects of basic (organic / inorganic) chemistry.
- Patents.
- Wastewater treatment.
- Abstracts referring to a conference contribution that does not contain sufficient data / information for regulatory risk assessment.
- Publications focusing on genetically modified organisms / transgenic crops; no data directly relevant to glyphosate evaluation (e.g. crop compositional analysis, gene flow, protein characterization).
- Publications where glyphosate or a relevant metabolite were not the focus of the publication.
- Secondary information including scientific and regulatory reviews[11].
- Articles dealing with political / socio / economic analysis.
- Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity).
- Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes.
- Findings not related to ecotoxicology, toxicology, residues, and environmental fate.
- Publications not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).

[11] Reviews have been partly evaluated on full text level as well – case by case decision.

- Publications dealing with a Roundup[12] formulation / other glyphosate formulations that is not the representative formulation for the AIR5 dossier and thus not relevant to the EU glyphosate renewal.
- Publications dealing with general pesticide exposures (not glyphosate specific).
- Publications generating endpoints that are not relatable to the EU level regulatory risk assessment (e.g. findings based on enzyme, cellular and molecular level etc.).
- Opinion articles where no new data is provided that can be used for the EU regulatory risk assessment.

2.4.2 Additional criteria for articles on the health and exposure of glyphosate

The scientific literature on the health effects of glyphosate can be subdivided in two main parts:

- Articles containing data on glyphosate acid and salts and on the reference glyphosate formulation MON 52276, and
- Articles only containing data on glyphosate formulations and/or co-formulants that have a composition different from that of the reference formulation MON 52276.

In the case of articles only relating to glyphosate formulations *in vitro* testing with the exception of cell/tissue systems[13] that are likely to come in direct contact with formulations and glyphosate formulations containing other active ingredients are excluded. The reason for the exclusion of *in vitro* testing of formulations to assess health effects as a result of systemic exposure is the presence of surfactants which produce cell toxicity based on the destabilization of the cell membrane and the mitochondrial membrane thus masking the specific toxicity of glyphosate. The toxicity of the co-formulants in combination with glyphosate is dependent on the concentration and the nature of the co-formulants and can be addressed on a case-by-case basis during the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

In the relevance of glyphosate data, those articles have been considered as not relevant (and reliable) for the assessment for systemic toxicity when only *in vitro* results are presented with glyphosate concentrations above 1 mM. This is because it is physiologically not possible to attain such concentrations in standard regulatory *in vivo* testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in *in vivo* test systems. It thus makes no sense to include such data in the risk assessment of glyphosate. Exceptions can be made in the event of direct contact with formulations resulting in localized effects, but then there is the contribution of the toxicity of the co-formulants which can be better addressed in the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

[12] Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contains a surfactant polyethoxylated tallow amine (also polyoxyethyleneamine, POEA) which is not permitted for use in the EU. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in articles dealing with POEA based Roundup formulations cannot be related to the representative formulation MON 52276 which is quaternary-ammonium based (and not POEA based).

[13] Glyphosate-based herbicides (GBH) contain surfactants that destabilize the cell membrane and the mitochondrial membrane and thus produce a toxicity that is not representative for glyphosate (see Levine S. L. et al, *Cell Biol. Toxicol. (2007) 23:385-400*). This has been clearly demonstrated in the scientific literature and also in some papers reviewed for this submission where *in vitro* glyphosate toxicity is compared against that of GBH and surfactants.

The limit of 1 mM has been based on the single dose oral pharmacokinetic data of a formulation containing 71.7% w/w glyphosate where an oral dose of 1,430 mg/kg bw in the rat gives plasma levels of 38.1 µg/mL or 0.225 mM after 2 hours. When extrapolated linearly (which is possible for glyphosate because it is not subject to hepatic metabolism) this gives plasma levels of 53.3 µg/mL or 0.315 mM at 2 hours after oral intake of 2,000 mg/kg bw and 107 µg/mL or 0.630 mM at 2 hours after oral intake of 4,000 mg/kg bw. A systemic concentration of glyphosate of 1 mM would then represent an oral dose of more than 6,000 mg/kg bw which is completely unreasonable for repeat dose experimental *in vivo* testing under today's OECD test guidelines. The ADI for glyphosate of 0.5 mg/kg bw/day corresponds with a daily systemic concentration of 0.17 µg/mL or 1 µM when a 60 kg person with 36 L extracellular fluid is considered with a glyphosate oral bioavailability of 20%. The daily systemic dose of glyphosate on the day of application (i.e. highest exposure day), based on the geometric mean of 3.2 µg/L in urine, of glyphosate applicators in the US is approx. 0.0001 mg/kg bw/day (Acquavella, 2004[14]) which is 1000 times less than the systemic dose (0.1 mg/kg bw) corresponding with the ADI oral dose of 0.5 mg/kg bw with 20% oral bioavailability.

Many articles that have been considered relevant for the risk assessment of glyphosate and have been assessed for reliability on full text basis, contain experimental data as well on glyphosate as such as on formulations (different from MON 52276) and co-formulants. In such cases, only the toxicology data pertinent to glyphosate and to the reference formulation (if that can be clearly stated by the author of the article) are summarized and discussed. In the case of articles on exposure monitoring and epidemiology, exposure to glyphosate formulations are considered.

2.4.3 Categorization of "relevant" articles at full-text level

Articles that were not excluded in the detailed assessment (see **Chapter 2.4.1** and **2.4.2**) were categorized as recommended in the EFSA 2092 GD - EFSA Journal 2011;9(2):2092, Point 5.4.1.

Category A *Studies that provide data for establishing or refining risk assessment parameters. These studies should be summarised in detail following the subsequent steps of the OECD Guidance documents (OECD, 2005; 2006) and should be considered for reliability.*

Category B Studies that are relevant to the data requirement, but in the opinion of the applicant provide only supplementary information that does not alter existing risk assessment parameters. A justification for such a decision should be provided.

Category C Studies for which relevance cannot be clearly determined. For each of these studies the applicants should provide an explanation of why the relevance of such studies could not be definitively determined.

The list of Category A articles can be found in **Table 32** and **Table 33**. The list of Category B articles and the justifications can be found in **Table 34** and **Table 35**. The list of Category C articles and the explanations can be found in **Table 36** and **Table 37**.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

[14] Acquavella J. F. *et al.* (2004), Environmental Health Perspectives, 112(3), 321-326.

2.5 Reliability assessment

For articles, which were identified, in the detailed assessment, as relevant articles of Category A (see **Chapter 2.4.3**) a reliability assessment was performed. The reliability criteria for each technical section are summarized in **Table 21 - Table 23**.

For relevant articles of Category A that were classified either as reliable (without restrictions) or reliable with restrictions, summaries were compiled.
Articles of Category A which were classified as non-reliable were downgraded to articles of Category B and justification for such a decision was provided.

Table 21: Reliability criteria for ecotoxicology, environmental fate and residues

Applied for	Reliability criteria
Ecotoxicology, Environmental Fate, Residues	For guideline-compliant studies (GLP studies): OECD, OPPTS, ISO, and others. The validity/quality criteria listed in the corresponding guidelines are met.
Ecotoxicology, Environmental Fate, Residues	(No) previous exposure to other chemicals is documented (where relevant).
Ecotoxicology	For aquatic studies, the test substance is dissolved in water or where a carrier is required, it is appropriate (non-toxic) and a carrier control / positive control is considered in the test design.
Environmental Fate, Residues	The test substance is dissolved in water or non-toxic solvent.
Ecotoxicology, Environmental Fate, Residues	Test item is sufficiently documented, and reported (i.e. purity, source, content, storage conditions).
Ecotoxicology	For tests including vertebrates, compliance of the batches used in toxicity studies compared to the technical specification.
Ecotoxicology	Species used in the experiment are clearly reported, including source, experimental conditions (where relevant): strain, adequate age/life stage, body weight, acclimatization, temperature, pH, oxygen (dissolved oxygen for aquatic tests) content, housing, light conditions, humidity (terrestrial species) incubation conditions, feeding.
Ecotoxicology	The validity criteria from relevant test guidelines can be extrapolated across different species but not necessarily across different test designs. If different, then the nature of the difference and impact should ideally be discussed.
Ecotoxicology, Environmental Fate, Residues	Only glyphosate or its metabolites is the test substance (excluding mixture), and information on application of the test substance is described.
Ecotoxicology, Environmental Fate, Residues	The endpoint measured can be considered a consequence of glyphosate (or a glyphosate metabolite).
Ecotoxicology, Environmental Fate, Residues	Study design / test system is well described, including when relevant: concentration in exposure media (dose rates, volume applied, etc.), dilution/mixture of test item (solvent, vehicle) where relevant.
Ecotoxicology, Environmental Fate, Residues	Analytical verifications performed in test media (concentration) / collected samples, stability of the test substance in test medium should be documented.

Applied for	**Reliability criteria**
Ecotoxicology	The test has been performed in several dose levels (at least 3) including a positive / negative control where relevant.
Ecotoxicology	Suitable exposure throughout the whole exposure period was demonstrated and reported.
Ecotoxicology	A clear concentration response relationship is reported – in studies where the dose response test design is employed.
Ecotoxicology	A sufficient number of animals per group to facilitate statistical analysis reported: mortality in control groups reported, observations/findings in positive/negative control clearly reported (where relevant).
Ecotoxicology, Environmental Fate, Residues	Assessment of the statistical power of the assay is possible with reported data.
Ecotoxicology, Environmental Fate, Residues	Statistical methodology is reported (e.g., checking the plots and confidence intervals).
Ecotoxicology	Description of the observations (including time-points), examinations, and analyses performed, with (where relevant) dissections being well documented.
Ecotoxicology	For terrestrial ecotoxicological studies in the laboratory or the field, the substrates used should be adequately described e.g. nature of substrate i.e. species of leaf or soil type.
Ecotoxicology, Environmental Fate, Residues	Field locations relevant / comparable to European conditions.
Ecotoxicology, Environmental Fate, Residues	Characterization of soil: texture (sandy loam, silty loam, loam, loamy sand), pH (5.5-8.0), cation exchange capacity, organic carbon (0.5-2-5%), bulk density, water retention, microbial biomass (~1% of organic carbon).
Ecotoxicology, Environmental Fate	Other soils where information on characterization by the parameters: pH, texture, CEC, organic carbon, bulk density, water holding capacity, microbial biomass.
Ecotoxicology, Environmental Fate, Residues	For tests including agricultural soils, they should not have been treated with test substance or similar substances for a minimum of 1 year.
Ecotoxicology, Environmental Fate	For soil samples, sampling from A-horizon, top 20 cm layers; soils freshly from field preferred (storage max 3 months at 4 +/- 2°C).
Ecotoxicology, Environmental Fate, Residues	Data on precipitation is recorded.
Environmental Fate	The temperature was in the range between 20-25°C and the moisture was reported.
Environmental Fate	The presence of glyphosate identified in samples were collected from European groundwater, soil, surface waters, sediments or air.
Ecotoxicology	For lab terrestrial studies, the temperature was appropriate to the species being tested and generally should fall within the range between 20-25°C and soil moisture / relative humidity was reported.
Ecotoxicology	For bee studies, temperature of the study should be appropriate to species.
Ecotoxicology	For lab aquatic studies:
	The source and / or composition of the media used should be described.
	The temperature of the water should be appropriate to the species being tested and generally fall within the 15-25ºC.

Applied for	**Reliability criteria**
Ecotoxicology, Residues	The residue data can be linked to a clearly described GAP table, appropriate in the context of the renewal of approval of glyphosate (crop, application method, doses, intervals, PHI).
Ecotoxicology, Environmental Fate, Residues	Analytical results present residues measurements which can be correlated with the existing residues definition of glyphosate, and where relevant its metabolites.
Ecotoxicology, Environmental Fate, Residues	Analytical methods are clearly described; and adequate statement of specificity and sensitivity of the analytical methods is included.
Ecotoxicology	Assessment of the ECX for the width of the confidence interval around the median value; and the certainty on the level of protection offered by the median ECX is reported.
Environmental Fate	Radiolabel characterization: purity, specific activity, location of label is reported.
Environmental Fate	If degradation kinetics are included: data tables / model description / statistical parameters for kinetic fit to be provided.
Environmental Fate, Residues	Monitoring data: description of matrix analysed, and analytical methods to be fully described.
Environmental Fate	Clear description of application rate and relevance to approved uses.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 22: Reliability criteria for toxicology – epidemiology and exposure studies

Reliability criteria – toxicology	
Epidemiology studies	**Exposure studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines/practices.	Study in accordance to valid internationally accepted testing guidelines/practices.
Study completely described and conducted following scientifically acceptable standards.	Study performed according to GLP.
	Study completely described and conducted following scientifically acceptable standards.
Test substance	**Test substance**
Exposure to formulations with only glyphosate as a.i.	Exposure to formulations with only glyphosate as a.i.
Exposure to formulations with glyphosate combined with other a.i.	Exposure to formulations with glyphosate combined with other a.i.
Exposure to various formulations of pesticides.	Exposure to various formulations of pesticides.
Study	**Study**
Study design – epidemiological method followed.	Study design clearly described.
Description of population investigated.	Population investigated sufficiently described.
Description of exposure circumstances.	Exposure circumstances sufficiently described.
Description of results.	Sampling scheme sufficiently documented.
Have confounding factors been considered.	Analytical method described in detail.
Statistical analysis.	Validation of analytical method reported.
	Monitoring results reported.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 23: Reliability criteria for toxicology – *in vitro* and *in vivo* studies

Reliability criteria – toxicology and metabolism	
In vitro **studies**	***In vivo*** **studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines.	Study in accordance to valid internationally accepted testing guidelines.
Study performed according to GLP.	Study performed according to GLP.
Study completely described and conducted following scientifically acceptable standards.	Study completely described and conducted following scientifically acceptable standards.
Test substance	**Test substance**
Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions).	Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions).
Only glyphosate acid or one of its salts is the tested substance .	Only glyphosate acid or one of its salts is the tested substance.
AMPA or other glyphosate metabolite is the tested substance.	AMPA or other glyphosate metabolite is the tested substance.
Study	**Study**
Test system clearly and completely described.	Test species clearly and completely described.
Test conditions clearly and completely described.	Test conditions clearly and completely described.
Metabolic activation system clearly and completely described.	Route and mode of administration described.
Test concentrations in physiologically acceptable range (< 1 mM).	Dose levels reported.
Cytotoxicity tests reported.	Number of animals used per dose level reported.
Positive and negative controls.	Method of analysis described for analysis test media.
Complete reporting of effects observed.	Validation of the analytical method.
Statistical methods described.	Analytical verifications of test media.
Historical negative and positive control data reported.	Complete reporting of effects observed.
Dose-effect relationship reported.	Statistical methods described.
	Historical control data of the laboratory reported.
	Dose-effect relationship reported.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

3 Search results

The full outcome of the literature search and evaluation is provided below.

Table 24: Summary of the literature search – all technical sections

	Number	Justification
Total number of articles retrieved from the search.	2643	n.a.
Total number of articles after removal of duplicates within all databases.	1522	n.a.
Total number of articles after manual removal of duplicates. [a)]	597	n.a.
Number of articles excluded after rapid assessment (title / abstract).	523	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	74	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	28	See Table 38
Number of articles not excluded after detailed assessment. [b)]	46	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	10	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 25: Results of the article selection process for ecotoxicology

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	93	n.a.
Number of articles excluded after rapid assessment (title / abstract).	61	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	32	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	19	See Table 38
Number of articles not excluded after detailed assessment. [b)]	13	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	3	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 26: Results of the article selection process for environmental fate

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	79	n.a.
Number of articles excluded after rapid assessment (title / abstract).	74	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	5	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	1	See Table 38
Number of articles not excluded after detailed assessment. [b)]	4	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	3	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 27: Results of the article selection process for residues

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	18	n.a.
Number of articles excluded after rapid assessment (title / abstract).	10	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	8	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	3	See Table 38
Number of articles not excluded after detailed assessment [b)]	5	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	0	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 28: Results of the article selection process for toxicology

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	76	n.a.
Number of articles excluded after rapid assessment (title / abstract).	47	See the Literature Review Excel File.
Total number of full-text documents assessed in detail	29	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	5	See Table 38
Number of articles not excluded after detailed assessment [b)]	24	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	4	See Table 32, Table 33

[a)] After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 29: Results of the article selection process for analytical methods

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	29	n.a.
Number of articles excluded after rapid assessment (title / abstract).	29	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment [b)]	n.a.	n.a.
Number of summaries presented in the dossier [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 30: Results of the article selection process for efficacy / agronomy

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	248	n.a.
Number of articles excluded after rapid assessment (title / abstract).	248	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b)]	n.a.	n.a.
Number of summaries presented in the dossier. [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 31: Results of the article selection process for "other non-relevant categories"

	Number	Justification
Total number of articles after manual removal of duplicates. a)	54	n.a.
Number of articles excluded after rapid assessment (title / abstract).	54	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. b)	n.a.	n.a.
Number of summaries presented in the dossier. c)	n.a.	n.a.

a) After removal of duplicates within the current search (Jan 2021 – 14 May 2021) and entries found already in the previous searches (Jan 2010 – Dec 2020). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

b) All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

c) Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 32: Relevant (category A) articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
1	CA 5.6	Gorga A. et al.	2021	Low Doses of Glyphosate/Roundup Alter Blood-Testis Barrier Integrity in Juvenile Rats.	Frontiers in endocrinology, (2021), Vol. 12, Article No. 615678	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
2	CA 5.6	Refaie A. A. et al.	2020	Hematological, biochemical, antioxidant and histopathological alterations in kidneys of wistar rat pups exposed to glyphosate herbicide during lactation period.	Current Topics in Pharmacology, (2020), Vol. 24, pp. 69-76	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
3	CA 5.6	Zhao L. et al.	2021	Glyphosate exposure attenuates testosterone synthesis via NR1D1 inhibition of StAR expression in mouse Leydig cells.	The Science of the total environment, (2021), Vol. 785, Article No. 147323	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
4	CA 5.9	Ferreira C. et al.	2021	Urine biomonitoring of glyphosate in children: Exposure and risk assessment.	Environmental research, (2021), Vol. 198, Article No. 111294	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
5	CA 7.3.1	Holtomo O. et al.	2021	Insight of UV-vis spectra and atmospheric implication for the reaction of OH radical towards glyphosate herbicide and its hydrates	RSC Advances (2021), Vol. 11, No. 27, pp. 16404-16418	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
6	CA 7.5	Geissen V. et al.	2021	Cocktails of pesticide residues in conventional and organic farming systems in Europe - Legacy of the past and turning point for the future.	Environmental pollution, (2021), Vol. 278, Article No. 116827	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
7	CA 7.5	Piel S. et al.	2021	Understanding the origins of herbicides metabolites in an agricultural watershed through their spatial and seasonal variations.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2021), Vol. 56, No. 4, pp. 313-332	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
8	CA 8.2.6.1, CA 8.2.7	Tajnaiova L. et al.	2020	Determination of the Ecotoxicity of Herbicides Roundup® Classic Pro and Garlon New in Aquatic and Terrestrial Environments	Plants (2020), Vol. 9, No. 9	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
9	CP 10.2.1	Gustinasari K. et al.	2021	Acute toxicity and morphology alterations of glyphosate-based herbicides to Daphnia magna and Cyclops vicinus.	Toxicological research, (2021), Vol. 37, No. 2, pp. 197-207	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
10	CP 10.3.1	Luo Q-H. et al.	2021	Effects of a commercially formulated glyphosate solutions at recommended concentrations on honeybee (Apis mellifera L.) behaviours.	Scientific reports, (2021), Vol. 11, No. 1, Article No. 2115	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.

Table 33: Relevant (category A) articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
4	Ferreira C. et al.	CA 5.9	2021	Urine biomonitoring of glyphosate in children: Exposure and risk assessment.	Environmental research, (2021), Vol. 198, Article No. 111294	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
6	Geissen V. et al.	CA 7.5	2021	Cocktails of pesticide residues in conventional and organic farming systems in Europe - Legacy of the past and turning point for the future.	Environmental pollution, (2021), Vol. 278, Article No. 116827	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
1	Gorga A. et al.	CA 5.6	2021	Low Doses of Glyphosate/Roundup Alter Blood-Testis Barrier Integrity in Juvenile Rats.	Frontiers in endocrinology, (2021), Vol. 12, Article No. 615678	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
9	Gustinasari K. et al.	CP 10.2.1	2021	Acute toxicity and morphology alterations of glyphosate-based herbicides to Daphnia magna and Cyclops vicinus.	Toxicological research, (2021), Vol. 37, No. 2, pp. 197-207	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
5	Holtomo O. et al.	CA 7.3.1	2021	Insight of UV-vis spectra and atmospheric implication for the reaction of OH radical towards glyphosate herbicide and its hydrates	RSC Advances (2021), Vol. 11, No. 27, pp. 16404-16418	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
10	Luo Q-H. et al.	CP 10.3.1	2021	Effects of a commercially formulated glyphosate solutions at recommended concentrations on honeybee (Apis mellifera L.) behaviours.	Scientific reports, (2021), Vol. 11, No. 1, Article No. 2115	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
7	Piel S. et al.	CA 7.5	2021	Understanding the origins of herbicides metabolites in an agricultural watershed through their spatial and seasonal variations.	Journal of environmental science and health. Part. B, Pesticides, food contaminants, and agricultural wastes, (2021), Vol. 56, No. 4, pp. 313-332	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
2	Refaie A. A. et al.	CA 5.6	2020	Hematological, biochemical, antioxidant and histopathological alterations in kidneys of wistar rat pups exposed to glyphosate herbicide during lactation period.	Current Topics in Pharmacology, (2020), Vol. 24, pp. 69-76	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
8	Tajnaiova L. et al.	CA 8.2.6.1, CA 8.2.7	2020	Determination of the Ecotoxicity of Herbicides Roundup® Classic Pro and Garlon New in Aquatic and Terrestrial Environments	Plants (2020), Vol. 9, No. 9	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
3	Zhao L. et al.	CA 5.6	2021	Glyphosate exposure attenuates testosterone synthesis via NR1D1 inhibition of StAR expression in mouse Leydig cells.	The Science of the total environment, (2021), Vol. 785, Article No. 147323	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.

Table 34: Relevant but supplementary (category B) articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
11	CA 5.4	Celik D. A. et al.	2021	DNA damages of widely used pesticides; a comet assay report for chlorothalonil and glyphosate potassium salt.	Fresenius Environmental Bulletin, (2021), Vol. 30, No. 4 A, pp. 4170-4176	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides supplementary information on genotoxicity of glyphosate potassium salt demonstrating DNA damage in a comet assay. However, the DNA damage at the mid and high dose is significantly lower than observed at the low dose. No details on the donors, no cytotoxicity assay, no metabolic activation system, no mention of other parameters evaluated in the Comet Assay (ie: hedgehogs, tail length, or tail moment). Only %tail DNA was measured. Furthermore, no positive control and no HCD provided.
12	CA 5.4	Congur G.	2021	Monitoring of glyphosate-DNA interaction and synergistic genotoxic effect of glyphosate and 2,4-dichlorophenoxyacetic acid using an electrochemical biosensor.	Environmental pollution, (2021), Vol. 271, Article No. 116360	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides a new in vitro method using electrochemical biosensor to monitor DNA interaction of glyphosate and demonstrates a negative effect onto double stranded DNA. The article is relevant but supplementary for the glyphosate a.s. treatment, however not relevant for the glyphosate formulation tested as it contains ether amine ethoxylate (similar to POEA). No dose-effect relationship, no positive control, no HCD. No statistical method presented. The purity of purchased glyphosate was also not provided.
13	CA 5.4	Wozniak E. et al.	2021	Glyphosate and AMPA Induce Alterations in Expression of Genes Involved in Chromatin Architecture in Human Peripheral Blood Mononuclear Cells (In Vitro).	International journal of molecular sciences, (2021), Vol. 22, No. 6	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides new information on the effect of glyphosate and the metabolite AMPA on expression of genes involved in chromatin architecture in human peripheral blood mononuclear cells (PBMCs). The results provide useful information on epigenetic processes that may be relevant but are difficult to interpret without further guidance. Therefore, the results are not expected to alter the existing risk assessment No HCD, no positive control. No real dose-effect relationship reported. The lack of positive control does not allow assessing the laboratory proficiency.
14	CA 5.6	Mutwedu V. B. et al.	2021	Growth performance and reproductive function impairment of glyphosate-based herbicide in male guinea pig (Cavia porcellus).	Veterinary medicine and science, (2021): Ahead of Print	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article presents the effects of a glyphosate-based formulation on growth performance and reproductive function impairment in male guinea pigs, which is not the typical animal model of choice for this type of investigation. This study provides interesting information on reproductive functions but the guinea pig is not a model validated for assessing reproductive toxicity in the EU evaluations. Atypical animal model, so historical control data in this species at this lab is paramount to interpret results, and no positive controls to confirm method validity. Findings are confounded by overt general toxicity at high surfactant doses. No necropsy observations of likely gastrointestinal damage resulting from high oral surfactant exposures. No information on the feed, and no method of analysis.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
15	CA 5.6	Upadhyay J. et al.	2020	Teratogenic effect of chlorpyrifos and glyphosate on pregnant rats: biochemical and morphological evaluations.	Journal of Pharmaceutical Research International, (2020), Vol. 32, No. 23, Article No. JPRI.61413	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides information on teratogenic effects of glyphosate-based formulation Topper 77 (Crystal Crop Protection Pvt. Ltd India) which is nowhere close to the glyphosate representative EU formulation for AIR5. According to the webpage (https://www.crystalcropprotection.com/internationalsales/detail/Topper) it contains 71% of glyphosate and it is a SG-formulation. The representative glyphosate formulation for the AIR5 is a SL formulation and contains 360 g a.s./L. Due to formulation tested, the article is classified as relevant but supplementary. No information on purity, content and storage conditions of the test material. One dose level/no dose-effect relationship, no HCD reported.
16	CA 5.7	Luna S. et al.	2021	Glyphosate exposure induces synaptic impairment in hippocampal neurons and cognitive deficits in developing rats.	Archives of toxicology, (2021) : Ahead of Print	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. In vitro test: Extremely high and irrelevant supraphysiological doses. No metabolic activation system and cytotoxicity assay. No HCD, no positive control. In vivo test: No information on body weight and age of animals, no information on diet, no HCD. Route of administration was by s.c. injection in the neck. This route of administration is not relevant and does not represent the normal ADME processes with low absorption and rapid elimination.
17	CA 5.8	Fan X. et al.	2021	Identification of lncRNA expression profiles and analysis of ceRNA in the hippocampus of perinatal glyphosate-exposed mice.	International journal of developmental neuroscience : the official journalof the International Society for Developmental Neuroscience, (2021) : Ahead of Print	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article analyses the role of long noncoding RNAs in the mechanisms of glyphosate neurotoxicity in neuronal development through a perinatal glyphosate exposure (PGE) mouse model. The results provide supplementary information on lncRNA and potential relationship with neurotoxicity. There is no information on the test material (purity, source, content). Test conditions are not clearly and completely described. Only one dose level was reported / no dose-response relationship. No “received dose calculation” possible without information on water consumption. Furthermore, no HCD reported.
18	CA 5.8	Mesnage R. et al.	2021	Urinary excretion of herbicide co-formulants after oral exposure to roundup MON 52276 in rats.	Environmental research, (2021), Vol. 197, Article No. 111103	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Useful information about the urinary excretion of herbicide co-formulants after exposure to a glyphosate formulation in rats. It is only related to surfactant absorption/excretion which is then formulation specific. No toxicological effect. Housing and environmental conditions not described. No information on diet. No confirmation of received dose.
19	CA 5.8	Mesnage R. et al.	2021	Use of Shotgun Metagenomics and Metabolomics to Evaluate the Impact of Glyphosate or Roundup MON 52276 on the Gut Microbiota and Serum	Environmental health perspectives, (2021), Vol. 129, No. 1, Article No. 17005	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Potential effects to gut microbiota and serum metabolome are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. However, this paper presents novel data with the use of multi-omics approaches evaluating the impact of glyphosate on the gut

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
				Metabolome of Sprague-Dawley Rats.		microbiota and serum metabolome of rats. This study may not be useful directly for risk assessment, but could help from a mode of action point of view. Diet, housing and environmental conditions not described, no HCD.
20	CA 5.8	Nozdrenko D. et al.	2021	Analysis of biomechanical parameters of muscle soleus contraction and blood biochemical parameters in rat with chronic glyphosate intoxication and therapeutic use of C60 fullerene.	International Journal of Molecular Sciences, (2021), Vol. 22, No. 9, Article No. 4977	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article presents an analysis of biomechanical and blood biochemical parameters in rat with chronic glyphosate intoxication and the use of C60 fullerene as effective nanotherapeutics in the treatment of glyphosate-based herbicide poisoning. This study provides useful information but does not alter the existing risk assessment. No information on the test material. Diet, housing and environmental conditions not described. Only one dose/no dose-effect relationship. No HCD.
21	CA 5.8	Pandher U. et al.	2021	Pulmonary inflammatory response from co-exposure to LPS and glyphosate.	Environmental toxicology and pharmacology, (2021) Vol. 86, Article No. 103651	The article has been classified as relevant by full text - Category B and **not reliable for** the following reason: The article presents an evaluation of the pulmonary inflammatory response from co-exposure to LPS and glyphosate. This study provides useful information concerning to mode of action but does not alter the existing risk assessment. Purity of glyphosate not stated. Diet, housing and environmental conditions not described. One dose/no dose-effect relationship, no HCD.
22	CA 5.8.2	Hashim A. R. et al.	2021	Ameliorative effect of N-acetylcysteine against glyphosate-induced hepatotoxicity in adult male albino rats: histopathological, biochemical, and molecular studies.	Environmental science and pollution research international, (2021) : Ahead of Print	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the ability of N-acetylcysteine to ameliorate toxic effects of glyphosate on the liver if administered prior to glyphosate exposure. Only one dose/no dose-response relationship, no HCD reported.
23	CA 5.9	Kabat G. C. et al.	2021	On recent meta-analyses of exposure to glyphosate and risk of non-Hodgkin's lymphoma in humans.	Cancer causes & control, (2021), Vol. 32, No. 4, pp. 409-414	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The purpose of this meta-analysis seems to be to critique the Zhang et al. meta-analysis (Exposure to glyphosatebased herbicides and risk for non-Hodgkin lymphoma: a metaanalysis and supporting evidence. Mutat Res (2019) 781:186–206) and to provide a commentary on meta-analyses that combine results from observational studies of pesticides with different designs and different levels of analytic sophistication. The publication does not provide any primary data or improvement of the underlying studies' limitations and therefore is not informative with respect to possible glyphosate/NHL risk per se. The authors' points about the selective nature of the Zhang et al. (2019) meta-analysis seem valid as do the points about the unaddressed systematic errors in the case-control studies included in previous glyphosate meta-analyses. Not reliable about glyphosate risk per se due to the limitations of the studies included in the meta-analysis. Provides valid criticisms about the Zhang et al. (2019) meta-analysis and generally about meta-analyses of pesticide epidemiology studies.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
24	CA 5.9	Kimura T. et al.	2021	Lessons for the clinical nephrologist: acute kidney injury by a glyphosate-surfactant herbicide.	Journal of nephrology, (2021) : Ahead of Print	The article / case report has been classified as relevant by full text - Category B for the following reason: This is a case report about an elderly patient who ingested a large volume of formulated glyphosate and presented with renal failure which improved with dialysis, which the patient was ultimately able to discontinue. They physicians obtained a kidney biopsy which showed vacuolization of the proximal tubules of the kidney which they suggest was related to the ingestion. Acute renal failure has been widely described in the literature following large ingestions of formulated glyphosate, however, most patients do not get kidney biopsies. This paper suggests that the associated renal failure is due to proximal tubular injury, which is not unexpected in these circumstances. Since this was a large intentional ingestion, it does not apply to agricultural use or practice.
25	CA 5.9	Kunapareddy T., Kalisetty S.	2021	Glyphosate poisoning - a case report.	Journal of postgraduate medicine, (2021), Vol. 67, No. 1, pp. 36-38	The article / case report has been classified as relevant by full text - Category B for the following reason: This is a case report of a patient who intentionally ingested a large amount of formulated glyphosate in a suicide attempt and developed multiorgan failure requiring intensive supportive care and ultimate recovery. Cases such as these have been widely described in the literature and outcomes such as these are not unexpected. The reassuring part of this case is that despite the suicide attempt, the patient survived.
26	CA 6.10	Billenkamp F. et al.	2021	No hints at glyphosate-induced ruminal dysbiosis in cows.	NPJ biofilms and microbiomes, (2021), Vol. 7, No. 1, Article No. 30	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: This is an experimental study to investigate potential detrimental effects of glyphosate on the cattle ruminental microbiome. Cows were fed with feedstuffs with strong differences in dietary fiber and concentrate feed proportion (CFP), either with or without glyphosate residues from pre-harvest treatment. The study is well conducted and analysed. The results show that glyphosate does not have adverse effects on the cattle ruminental microbiome, as it was previously suggested by in vitro studies. While the publication does not correspond to any specific EU data requirement it nevertheless includes interesting data indicating that the residues of glyphosate in cattle feed do not impact cattle ruminental microbiome. The study is reliable with regard to methodology, analysis and statistical evaluation. Further details to animal feedstuff (exposure) provided in: Schnabel, K. et al. Effects of glyphosate residues and different concentrate feed proportions on performance, energy metabolism and health characteristics in lactating dairy cows. Arch. Anim. Nutr. 71, 413 – 427 (2017).
27	CA 6.10	Heymann A. et al.	2021	Effects of glyphosate residues and different concentrate feed proportions in dairy cow rations on hepatic gene expression, liver histology and biochemical blood parameters.	PloS one, (2021), Vol. 16, No. 2, Article No. e0246679	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: This is an experimental study to investigate effects of glyphosate on the cattle hepatotoxic effects (61 lactating German Holstein cows). Cows were fed with feedstuffs with strong differences concentrate feed proportion (CFP), either with or without addition of glyphosate. The results show that glyphosate has no adverse effects on the liver of dairy cows (GLY-responsive gene expression/liver-related blood parameters). The study is reliable with regard to methodology, analysis and

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						statistical evaluation. Further details to animal feedstuff (exposure) provided in: Schnabel, K. et al. Effects of glyphosate residues and different concentrate feed proportions on performance, energy metabolism and health characteristics in lactating dairy cows. Arch. Anim. Nutr. 71, 413 – 427 (2017).
28	CA 6.10	Kolakowski B. M. et al.	2021	Analysis of Microbiological and Chemical Hazards in Edible Insects Available to Canadian Consumers.	Journal of food protection, (2021) : Ahead of Print	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: Monitoring data from Canada on pesticides in edible insects (crickets, silkworm, 47 samples). Glyphosate was detected in 36 samples (0.0064-0.15 mg/kg), AMPA was detected in 9 samples (0.007-0.45 mg/kg). Origin of residues unclear. At this timepoint this paper is not relevant for EU because no MRLs are set on insect derived food products. The study is reliable with regard to monitoring data.
29	CA 6.5	Tittlemier S. A. et al.	2020	Fate of glyphosate in wheat during milling and bread production. Focus Issue: Grain and grain-based food safety.	Cereal Chemistry, (2020), Vol. 98, No. 1, pp. 100-108	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Processing study of wheat from Canada; only glyphosate was detected, no residues of AMPA. On average, in the pearling process 50% of glyphosate resided in the outer 17% of the kernels, while in the milling process 81% of glyphosate in the wheat was associated with the bran, shorts, and feeds milling fractions. No changes in glyphosate concentration (corrected for moisture content) were observed during the preparation of dough, fermented dough, and bread. No endpoint is derived, this study is considered supportive for processing of wheat, however no clear processing factors can be derived. Restrictions include absence of validation data in different processed wheat matrices. For the analytical method it is referred to another publication (Tittlemier et al., 2017, Evaluation of a commercially available enzyme-linked immunosorbent assay and a liquid chromatography-tandem mass spectrometric method for the analysis of glyphosate in wheat, oats, barley, malt, and lentils. Cereal Chemistry, 94, 1028-1036).
30	CA 6.9	de Souza Ferreira A. P. et al.	2021	Exposure assessment of glyphosate residues in soy-based infant formulas from the Brazilian market.	Journal fur Verbraucherschutz und Lebensmittelsicherheit: Journal of consumer protection and food safety, (2021), Vol. 16, No. 1, pp. 45-50	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: Glyphosate and AMPA residues were found in Brazilian infant formulas produced with soy extract and/or protein. The residue levels found in the analysed samples are not relevant to the representative EU uses supported in the AIR5 dossier. Based on the monitoring data, a risk assessment has been conducted for infants (0-5 months and 6-11 months age). The study might support the provided risk assessments to show absence of consumer risk due to GLY/AMPA residues. The study is reliable with regard to monitoring data.
31	CA 7.5	Kaszkowiak K. et al.	2021	The concentration of glyphosate in the tap water in Greater Poland Region.	European Journal of Biological Research, (2021), Vol. 11, No. 1, pp. 57-64	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The concentration of glyphosate was measured in 66 randomly collected drinking water samples from separate Water Treatment Plants in Poland. Own data was generated. The concentration of glyphosate in the tested samples did not exceed 0.33 µg/L. The sampling procedure and timing as well as sample volume and storage time prior to analysis are not reported. Furthermore, the analytical method was not described

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						in detail and not validated. The article does not provide numerical concentrations for glyphosate but only the maximum detected concentration. Individual results are only presented graphically and cannot be assigned to a sampling location.
32	CA 8.2.1	Liao Yi-yu et al.	2020	Study on Acute and Chronic Toxicity of Glyphosate to Zebrafish	Guangzhou Huagong, (2020) Vol. 48, No. 21, pp. 66-68	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The study reports on endpoints potentially relevant for the aquatic risk assessment (96-hours LC50). However, the study was inadequately reported and can therefore not be deemed reliable based on the following aspects: The test item was not identified (just the source), the exposure concentrations were not reported; only the number of levels (5). Exposure concentrations were not analytically verified. Results per treatment level were not reported, only the calculated LC50 values. Mortality data for the control group were not reported either. In addition, information on the life stage and source of the organisms as well as on important water parameters like pH and dissolved oxygen content is missing. It is impossible to assess whether there was a clear dose-response relationship or whether other factors could have influenced the survival and fitness of the test organisms. The reported results can therefore not be used in a context of a regulatory risk assessment.
33	CA 8.2.1, CP 10.2.1	Shiry N. et al.	2020	A bioassay on tissue cholinesterase activity of Rutilus kutum (Kamensky, 1901) exposed to some common pesticides in Iran.	Veterinary research forum : an international quarterly journal, (2020), Vol. 11, No. 4, pp. 325-331	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. While the study reports on regulatory relevant endpoints for the acute toxicity to fish, the reporting is lacking essential information to ascertain the reliability of the derived endpoints. The identity of the test item (whether the active substance or a formulated product) was not clearly reported, purity of the test item was not provided. The application of the test item is not specified, it is unclear whether a solvent carrier was used. Exposure concentrations were not analytically verified. Composition of the test medium was not reported, neither were the environmental conditions during the test. Furthermore, there is barely any information on the control group, no results are reported for the control and it is unclear if the control group consisted of the same number of individuals as the treatment groups. While LC50 and LOEC values are reported, there is no information on the data distribution, goodness of fit or standard error. Raw data are not reported, hence it is impossible to assess the reliability of the reported endpoints. Overall, the study has do be deemed not reliable due to missing essential information in the report.
34	CA 8.2.5.2	Bringer A. et al.	2021	Toxicity and risk assessment of six widely used pesticides on embryo-larval development of the Pacific oyster, Crassostrea gigas.	The Science of the total environment, (2021), Vol. 779, Article No. 146343	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The test design allows for the derivation of NOECs, but for the most sensitive endpoint (Abnormal D-larvae (%)), the NOEC was below the lowest tested concentration, therefore no regulatory relevant endpoint can be determined. However, the study provides supplementary information on the sub-lethal effects of glyphosate on oyster larvae (specifically Crassostrea gigas) and could be useful as part of a broader

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						discussion Exposure concentrations were not analytically verified (stock solutions only). For the most sensitive endpoint (larvae malformations), significant effects were determined at the lowest tested concentration, therefore no NOEC could be determined. Purity of the test item was not provided.
35	CA 8.2.7.	Yu H. et al.	2021	Effects of microplastics and glyphosate on growth rate, morphological plasticity, photosynthesis, and oxidative stress in the aquatic species Salvinia cucullata.	Environmental pollution, (2021), Vol. 279, Article No. 116900	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The study reports on effects of microplastics and glyphosate on growth rate, morphological plasticity, photosynthesis, and oxidative stress in the aquatic species Salvinia cucullata. Of all reported endpoints, only plant growth variables (relative growth rate (RGR), average specific leaf growth rate (ASLG), and yellow-leaf percentage (YLP)) are not on a molecular or cellular level and could be of potential relevance for an EU-level risk assessment for aquatic plants. It should be noted that currently no standardized test guideline for the testing of chemicals with Salvinia cucullata exists. Furthermore, no regulatory relevant endpoints were calculated (e.g. ECx) and the resuls were not presented in a way that would allow conducting such calculations retroactively. However, it can be inferred from the study that the NOEC for relative growth rate would be 25 mg glyphosate/L and this could therefore serve as supporting information in a regulatory context. While the study reports on endpoints with potential relevance to the regulatory risk assessment of aquatic plants, specifically growth rate, the study can not be deemed reliable due to issues with the test design as well as reporting of the data. The most significant aspects are listed in the following: The test plants were collected from a not specified natural habitat and previous contact with contaminants that could affect the outcome of the test can not be ruled out. The application of the test item is not described and it is unclear whether a solvent carrier was used. If so, a solvent control would have to be included to dismiss possible toxic effects of the carrier. Exposure concentrations were not analytically verified. The test duration was 7 days without renewal of the test substance, the actual exposure concentrations could vary significantly from the nominal concentrations. Composition of the test medium was not reported. Furthermore, the results on growth rate are only reported in the form of a bar graph. Exact values can not be derived from the graph and statistical power can not be assessed. As no raw data are reported, statistical calculations can not be conducted retroactively. It has to be concluded that the study is not reliable for regulatory risk assessment purposes.
36	CA 8.6.2	Jiang L. et al.	2021	Earthworm casts restrained the accumulation and phytotoxicity of soil glyphosate to cowpea (Vigna unguiculata (L.) Walp.) plants.	Chemosphere, (2021), Vol. 279, Article No. 130571	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study primarily assesses the effects of earthworm casts on the accumulation and phytotoxicity of soil bound glyphosate to cowpea plants (Vigna unguiculata). However, the study also reports on the effects of glyphosate alone applied to soil at 12.15 m/kg on on root and shoot length of Vigna unguiculata (in a sort of a seedling growth test). Altough the test is not conducted according to any guidance, its results can be used as part of a broader discussion on the effects of glyphosate on non-target

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						terrestrial plants. While the study reports on parameters with potential relevance to the regulatory risk assessment of terrestrial plants, specifically shoot and root weight and shoot and root length of Vigna unguiculata, the study can not be deemed fully reliable due to the following issues. The soil sample was collected from a not specified sampling spot at Danzhou National Agricultural Science and Technology Park. Previous contact with contaminants that could affect the outcome of the test can not be ruled out. In addition, not all relevant soil parameters are reported on, information on cation exchange capacity, bulk density, water retention and microbial biomass is missing from the report. The application of the test item is not described and it is unclear whether a solvent carrier was used. Furthermore, exposure concentrations were not analytically verified. While analytical methods were reported in the material and methods section of the report, no analytical results pertaining to the plant growth experiment are reported. The test duration was 5 weeks, the actual exposure concentrations could vary significantly from the nominal concentrations. The results for the plant growth parameters (weight and length) are only reported in the form of a bar graph, which does not allow for derivation of exact values. Statistical differences between the treatment groups are marked in the graphic, however the underlying statistical methods are not reported. As no raw data are reported, statistical calculations can not be conducted retroactively.
37	CP 10.2.1	Akinbadewa A. O. et al.	2020	Sublethal effect of glyphosate [N-(phosphonomethyl)glycine] on growth performance and biochemical activities in some organs of Clarias gariepinus (Burchell, 1822) fingerlings.	Agraarteadus, (2020), Vol. 31, No. 2, pp. 122-130	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: No regulatory relevant endpoints are provided, but the findings of the work could serve to support acute effects of glyphosate on fish (specifically Clarias gariepinus) as part of a broader discussion. Chronic effects were calculated at 70 days, which is not an agreed time frame for a test with fish juveniles, and therefore they are not useful for the RA (in fact, at 28 days no mortality at any tested rate was detected). No guideline was followed. Concentrations of the test item in the exposure medium were not analytically verified and the test was conducted under static (96-hour acute test) or semi-static (70 days chronic test) conditions. The accuracy of the exposure concentrations is therefore unclear. Furthermore, endpoints relevant for the risk assessment, such as ECx values, were not calculated. For the long-term exposure test only 2 treatment levels were tested at an aleatory time frame (70 days), therefore ECx values can not be calculated and conclusions should be considered with caution. The test item was not sufficiently described.
38	CP 10.2.2	Sanudi F. et al.	2021	Effects of Glyphosate Herbicide on Physiological Parameters of Koi Carp, Cyprinus Carpio (Linnaeus, 1758) Fingerlings.	Indian Journal of Animal Research, (2021) Vol. 55, No. 3, pp. 266-270	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The study reports on chronic effects of glyphosate exposure to Koi carp (Cyprinus Carpio), incl. oxygen consumption rate, ammonia-nitrogen excretion rate, oxygen:nitrogen ratio and food consumption, over a duration of 28 days. The aforementioned parameters are not currently included in the context of an EU-level risk assessment. No ECx or

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						NOEC values were reported (only a LOEC of 3.3. mg/L can be established). Therefore, the study can only be used as supplementary information. While the study reports on potentially relevant endpoints for the chronic toxicity to fish, the studies presents with a number of weaknesses due to which the study has to be deemd “not-reliable”. The most significant issues are listed in the following: The application of the test item is not specified, it is unclear whether a solvent carrier was used. Exposure concentrations were not analytically verified and since the test design was semi-static (medium exchange every 24h), the actual exposure concentrations could vary significantly from the nominal concentrations. Composition of the test medium was not reported, neither were the environmental conditions during the test. Furthermore, the exact number of organisms per treatment level and replicates per treatment level are not reported. Statistical methods were applied but not described, and since raw data are not reported it is impossible to assess the statistical power retroactively. Lastly, while there were effects on all assessed parameters compared to the control group, not all parameters responded in a clear dose dependent fashion.
39	CP 10.6	Strandberg B. et al.	2021	Effects of glyphosate spray-drift on plant flowering.	Environmental pollution, (2021), Vol. 280, Article No. 116953	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study reports on spray-drift exposure of non-target plants to the glyphosate formulation Roundup Bio; 360 g a.i./L using tractor-mounted spray-drift reducing nozzles and effects on plant cover and flowering.While spray drift exposure is of relevance for the non-target plants (off-field) risk assessment, the effects assessed in this study (flowering and plant cover) are not currently taken into account in the context of an EU-level risk assessment. However, the study could be used in the context of a broader discussion regarding mitigation measures for the reduction of spray-drift exposure to non-target plants. The study reports on spray-drift exposure of non-target plants to the glyphosate formulation Roundup Bio; 360 g a.i./L using tractor-mounted spray-drift reducing nozzles and effects on plant cover and flowering. The study was deemed reliable with restrictions based on the following aspects: The tank solution contained a dye marker, sodium fluorescein, along with the glyphosate formulation. While the authors state that the substance has previously been used in tracer experiments, some including biological effects of pesticides, they also state that no publications on the effect of foliar application of sodium fluorescein on plants have been identified. Possible effects of the dye marker on the test plants can therefore not be excluded with certainty. Furthermore the results for estimated glyphosate spray drift deposition in relation to distance to edge of field and spray track are only reported in graphical form, which does not allow for derivation of exact values. The same goes for the effects on flowering in relation to glyphosate exposure. No raw data are reported.

Table 35: Relevant but supplementary (category B) articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
37	Akinbadewa A. O. et al.	CP 10.2.1	2020	Sublethal effect of glyphosate [N-(phosphonomethyl)glycine] on growth performance and biochemical activities in some organs of Clarias gariepinus (Burchell, 1822) fingerlings.	Agraarteadus, (2020), Vol. 31, No. 2, pp. 122-130	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: No regulatory relevant endpoints are provided, but the findings of the work could serve to support acute effects of glyphosate on fish (specifically Clarias gariepinus) as part of a broader discussion. Chronic effects were calculated at 70 days, which is not an agreed time frame for a test with fish juveniles, and therefore they are not useful for the RA (in fact, at 28 days no mortality at any tested rate was detected). No guideline was followed. Concentrations of the test item in the exposure medium were not analytically verified and the test was conducted under static (96-hour acute test) or semi-static (70 days chronic test) conditions. The accuracy of the exposure concentrations is therefore unclear. Furthermore, endpoints relevant for the risk assessment, such as ECx values, were not calculated. For the long-term exposure test only 2 treatment levels were tested at an aleatory time frame (70 days), therefore ECx values can not be calculated and conclusions should be considered with caution. The test item was not sufficiently described.
26	Billenkamp F. et al.	CA 6.10	2021	No hints at glyphosate-induced ruminal dysbiosis in cows.	NPJ biofilms and microbiomes, (2021), Vol. 7, No. 1, Article No. 30	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: This is an experimental study to investigate potential detrimental effects of glyphosate on the cattle ruminental microbiome. Cows were fed with feedstuffs with strong differences in dietary fiber and concentrate feed proportion (CFP), either with or without glyphosate residues from pre-harvest treatment. The study is well conducted and analysed. The results show that glyphosate does not have adverse effects on the cattle ruminental microbiome, as it was previously suggested by in vitro studies. While the publication does not correspond to any specific EU data requirement it nevertheless includes interesting data indicating that the residues of glyphosate in cattle feed do not impact cattle ruminental microbiome. The study is reliable with regard to methodology, analysis and statistical evaluation. Further details to animal feedstuff (exposure) provided in: Schnabel, K. et al. Effects of glyphosate residues and different concentrate feed proportions on performance, energy metabolism and health characteristics in lactating dairy cows. Arch. Anim. Nutr. 71, 413 – 427 (2017).
34	Bringer A. et al.	CA 8.2.5.2	2021	Toxicity and risk assessment of six widely used pesticides on embryo-larval development of the Pacific oyster, Crassostrea gigas.	The Science of the total environment, (2021), Vol. 779, Article No. 146343	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The test design allows for the derivation of NOECs, but for the most sensitive endpoint (Abnormal D-larvae (%)), the NOEC was below the lowest tested concentration, therefore no regulatory relevant endpoint can be determined. However, the study provides supplementary information on the sub-lethal effects of glyphosate on oyster larvae (specifically Crassostrea gigas) and could be useful as part of a broader discussion Exposure concentrations were not analytically verified (stock

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						solutions only). For the most sensitive endpoint (larvae malformations), significant effects were determined at the lowest tested concentration, therefore no NOEC could be determined. Purity of the test item was not provided.
11	Celik D. A. et al.	CA 5.4	2021	DNA damages of widely used pesticides; a comet assay report for chlorothalonil and glyphosate potassium salt.	Fresenius Environmental Bulletin, (2021), Vol. 30, No. 4 A, pp. 4170-4176	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides supplementary information on genotoxicity of glyphosate potassium salt demonstrating DNA damage in a comet assay. However, the DNA damage at the mid and high dose is significantly lower than observed at the low dose. No details on the donors, no cytotoxicity assay, no metabolic activation system, no mention of other parameters evaluated in the Comet Assay (ie: hedgehogs, tail length, or tail moment). Only %tail DNA was measured. Furthermore, no positive control and no HCD provided.
12	Congur G.	CA 5.4	2021	Monitoring of glyphosate-DNA interaction and synergistic genotoxic effect of glyphosate and 2,4-dichlorophenoxyacetic acid using an electrochemical biosensor.	Environmental pollution, (2021), Vol. 271, Article No. 116360	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides a new in vitro method using electrochemical biosensor to monitor DNA interaction of glyphosate and demonstrates a negative effect onto double stranded DNA. The article is relevant but supplementary for the glyphosate a.s. treatment, however not relevant for the glyphosate formulation tested as it contains ether amine ethoxylate (similar to POEA). No dose-effect relationship, no positive control, no HCD. No statistical method presented. The purity of purchased glyphosate was also not provided.
30	de Souza Ferreira A. P. et al.	CA 6.9	2021	Exposure assessment of glyphosate residues in soy-based infant formulas from the Brazilian market.	Journal fur Verbraucherschutz und Lebensmittelsicherheit: Journal of consumer protection and food safety, (2021), Vol. 16, No. 1, pp. 45-50	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: Glyphosate and AMPA residues were found in Brazilian infant formulas produced with soy extract and/or protein. The residue levels found in the analysed samples are not relevant to the representative EU uses supported in the AIR5 dossier. Based on the monitoring data, a risk assessment has been conducted for infants (0-5 months and 6-11 months age). The study might support the provided risk assessments to show absence of consumer risk due to GLY/AMPA residues. The study is reliable with regard to monitoring data.
17	Fan X. et al.	CA 5.8	2021	Identification of lncRNA expression profiles and analysis of ceRNA in the hippocampus of perinatal glyphosate-exposed mice.	International journal of developmental neuroscience : the official journalof the International Society for Developmental Neuroscience, (2021) : Ahead of Print	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article analyses the role of long noncoding RNAs in the mechanisms of glyphosate neurotoxicity in neuronal development through a perinatal glyphosate exposure (PGE) mouse model. The results provide supplementary information on lncRNA and potential relationship with neurotoxicity. There is no information on the test material (purity, source, content). Test conditions are not clearly and completely described. Only one dose level was reported / no dose-response relationship. No “received dose calculation” possible without information on water consumption. Furthermore, no HCD reported.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
22	Hashim A. R. et al.	CA 5.8.2	2021	Ameliorative effect of N-acetylcysteine against glyphosate-induced hepatotoxicity in adult male albino rats: histopathological, biochemical, and molecular studies.	Environmental science and pollution research international, (2021) : Ahead of Print	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the ability of N-acetylcysteine to ameliorate toxic effects of glyphosate on the liver if administered prior to glyphosate exposure. Only one dose/no dose-response relationship, no HCD reported.
27	Heymann A. et al.	CA 6.10	2021	Effects of glyphosate residues and different concentrate feed proportions in dairy cow rations on hepatic gene expression, liver histology and biochemical blood parameters.	PloS one, (2021), Vol. 16, No. 2, Article No. e0246679	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: This is an experimental study to investigate effects of glyphosate on the cattle hepatotoxic effects (61 lactating German Holstein cows). Cows were fed with feedstuffs with strong differences concentrate feed proportion (CFP), either with or without addition of glyphosate. The results show that glyphosate has no adverse effects on the liver of dairy cows (GLY-responsive gene expression/liver-related blood parameters). The study is reliable with regard to methodology, analysis and statistical evaluation. Further details to animal feedstuff (exposure) provided in: Schnabel, K. et al. Effects of glyphosate residues and different concentrate feed proportions on performance, energy metabolism and health characteristics in lactating dairy cows. Arch. Anim. Nutr. 71, 413 – 427 (2017).
36	Jiang L. et al.	CA 8.6.2	2021	Earthworm casts restrained the accumulation and phytotoxicity of soil glyphosate to cowpea (Vigna unguiculata (L.) Walp.) plants.	Chemosphere, (2021), Vol. 279, Article No. 130571	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study primarily assesses the effects of earthworm casts on the accumulation and phytotoxicity of soil bound glyphosate to cowpea plants (Vigna unguiculata). However, the study also reports on the effects of glyphosate alone applied to soil at 12.15 m/kg on on root and shoot length of Vigna unguiculata (in a sort of a seedling growth test). Altough the test is not conducted according to any guidance, its results can be used as part of a broader discussion on the effects of glyphosate on non-target terrestrial plants. While the study reports on parameters with potential relevance to the regulatory risk assessment of terrestrial plants, specifically shoot and root weight and shoot and root length of Vigna unguiculata, the study can not be deemed fully reliable due to the following issues. The soil sample was collected from a not specified sampling spot at Danzhou National Agricultural Science and Technology Park. Previous contact with contaminants that could affect the outcome of the test can not be ruled out. In addition, not all relevant soil parameters are reported on, information on cation exchange capacity, bulk density, water retention and microbial biomass is missing from the report. The application of the test item is not described and it is unclear whether a solvent carrier was used. Furthermore, exposure concentrations were not analytically verified. While analytical methods were reported in the material and methods section of the report, no analytical results pertaining to the plant growth experiment are reported. The test duration was 5 weeks, the actual exposure concentrations could vary significantly from the nominal concentrations. The results for the plant growth parameters (weight and length)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						are only reported in the form of a bar graph, which does not allow for derivation of exact values. Statistical differences between the treatment groups are marked in the graphic, however the underlying statistical methods are not reported. As no raw data are reported, statistical calculations can not be conducted retroactively.
23	Kabat G. C. et al.	CA 5.9	2021	On recent meta-analyses of exposure to glyphosate and risk of non-Hodgkin's lymphoma in humans.	Cancer causes & control, (2021), Vol. 32, No. 4, pp. 409-414	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The purpose of this meta-analysis seems to be to critique the Zhang et al. meta-analysis (Exposure to glyphosatebased herbicides and risk for non-Hodgkin lymphoma: a metaanalysis and supporting evidence. Mutat Res (2019) 781:186–206) and to provide a commentary on meta-analyses that combine results from observational studies of pesticides with different designs and different levels of analytic sophistication. The publication does not provide any primary data or improvement of the underlying studies' limitations and therefore is not informative with respect to possible glyphosate/NHL risk per se. The authors' points about the selective nature of the Zhang et al. (2019) meta-analysis seem valid as do the points about the unaddressed systematic errors in the case-control studies included in previous glyphosate meta-analyses. Not reliable about glyphosate risk per se due to the limitations of the studies included in the meta-analysis. Provides valid criticisms about the Zhang et al. (2019) meta-analysis and generally about meta-analyses of pesticide epidemiology studies.
31	Kaszkowiak K. et al.	CA 7.5	2021	The concentration of glyphosate in the tap water in Greater Poland Region.	European Journal of Biological Research, (2021), Vol. 11, No. 1, pp. 57-64	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The concentration of glyphosate was measured in 66 randomly collected drinking water samples from separate Water Treatment Plants in Poland. Own data was generated. The concentration of glyphosate in the tested samples did not exceed 0.33 µg/L. The sampling procedure and timing as well as sample volume and storage time prior to analysis are not reported. Furthermore, the analytical method was not described in detail and not validated. The article does not provide numerical concentrations for glyphosate but only the maximum detected concentration. Individual results are only presented graphically and cannot be assigned to a sampling location.
24	Kimura T. et al.	CA 5.9	2021	Lessons for the clinical nephrologist: acute kidney injury by a glyphosate-surfactant herbicide.	Journal of nephrology, (2021) : Ahead of Print	The article / case report has been classified as relevant by full text - Category B for the following reason: This is a case report about an elderly patient who ingested a large volume of formulated glyphosate and presented with renal failure which improved with dialysis, which the patient was ultimately able to discontinue. They physicians obtained a kidney biopsy which showed vacuolization of the proximal tubules of the kidney which they suggest was related to the ingestion. Acute renal failure has been widely described in the literature following large ingestions of formulated glyphosate, however, most patients do not get kidney biopsies. This paper suggests that the associated renal failure is due to proximal tubular injury, which is not unexpected in these

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						circumstances. Since this was a large intentional ingestion, it does not apply to agricultural use or practice.
28	Kolakowski B. M. et al.	CA 6.10	2021	Analysis of Microbiological and Chemical Hazards in Edible Insects Available to Canadian Consumers.	Journal of food protection, (2021) : Ahead of Print	The article has been classified as relevant by full text - Category B and reliable without restrictions for the following reason: Monitoring data from Canada on pesticides in edible insects (crickets, silkworm, 47 samples). Glyphosate was detected in 36 samples (0.0064-0.15 mg/kg), AMPA was detected in 9 samples (0.007-0.45 mg/kg). Origin of residues unclear. At this timepoint this paper is not relevant for EU because no MRLs are set on insect derived food products. The study is reliable with regard to monitoring data.
25	Kunapareddy T., Kalisetty S.	CA 5.9	2021	Glyphosate poisoning - a case report.	Journal of postgraduate medicine, (2021), Vol. 67, No. 1, pp. 36-38	The article / case report has been classified as relevant by full text - Category B for the following reason: This is a case report of a patient who intentionally ingested a large amount of formulated glyphosate in a suicide attempt and developed multiorgan failure requiring intensive supportive care and ultimate recovery. Cases such as these have been widely described in the literature and outcomes such as these are not unexpected. The reassuring part of this case is that despite the suicide attempt, the patient survived.
32	Liao Yi-yu et al.	CA 8.2.1	2020	Study on Acute and Chronic Toxicity of Glyphosate to Zebrafish.	Guangzhou Huagong, (2020) Vol. 48, No. 21, pp. 66-68	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The study reports on endpoints potentially relevant for the aquatic risk assessment (96-hours LC50). However, the study was inadequately reported and can therefore not be deemed reliable based on the following aspects: The test item was not identified (just the source), the exposure concentrations were not reported; only the number of levels (5). Exposure concentrations were not analytically verified. Results per treatment level were not reported, only the calculated LC50 values. Mortality data for the control group were not reported either. In addition, information on the life stage and source of the organisms as well as on important water parameters like pH and dissolved oxygen content is missing. It is impossible to assess whether there was a clear dose-response relationship or whether other factors could have influenced the survival and fitness of the test organisms. The reported results can therefore not be used in a context of a regulatory risk assessment.
16	Luna S. et al.	CA 5.7	2021	Glyphosate exposure induces synaptic impairment in hippocampal neurons and cognitive deficits in developing rats.	Archives of toxicology, (2021) : Ahead of Print	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. In vitro test: Extremely high and irrelevant supraphysiological doses. No metabolic activation system and cytotoxicity assay. No HCD, no positive control. In vivo test: No information on body weight and age of animals, no information on diet, no HCD. Route of administration was by s.c. injection in the neck. This route of administration is not relevant and does not represent the normal ADME processes with low absorption and rapid elimination.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
18	Mesnage R. et al.	CA 5.8	2021	Urinary excretion of herbicide co-formulants after oral exposure to roundup MON 52276 in rats.	Environmental research, (2021), Vol. 197, Article No. 111103	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Useful information about the urinary excretion of herbicide co-formulants after exposure to a glyphosate formulation in rats. It is only related to surfactant absorption/excretion which is then formulation specific. No toxicological effect. Housing and environmental conditions not described. No information on diet. No confirmation of received dose.
19	Mesnage R. et al.	CA 5.8	2021	Use of Shotgun Metagenomics and Metabolomics to Evaluate the Impact of Glyphosate or Roundup MON 52276 on the Gut Microbiota and Serum Metabolome of Sprague-Dawley Rats.	Environmental health perspectives, (2021), Vol. 129, No. 1, Article No. 17005	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Potential effects to gut microbiota and serum metabolome are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear. However, this paper presents novel data with the use of multi-omics approaches evaluating the impact of glyphosate on the gut microbiota and serum metabolome of rats. This study may not be useful directly for risk assessment, but could help from a mode of action point of view. Diet, housing and environmental conditions not described, no HCD.
14	Mutwedu V. B. et al.	CA 5.6	2021	Growth performance and reproductive function impairment of glyphosate-based herbicide in male guinea pig (Cavia porcellus).	Veterinary medicine and science, (2021): Ahead of Print	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article presents the effects of a glyphosate-based formulation on growth performance and reproductive function impairment in male guinea pigs, which is not the typical animal model of choice for this type of investigation. This study provides interesting information on reproductive functions but the guinea pig is not a model validated for assessing reproductive toxicity in the EU evaluations. Atypical animal model, so historical control data in this species at this lab is paramount to interpret results, and no positive controls to confirm method validity. Findings are confounded by overt general toxicity at high surfactant doses. No necropsy observations of likely gastrointestinal damage resulting from high oral surfactant exposures. No information on the feed, and no method of analysis.
20	Nozdrenko D. et al.	CA 5.8	2021	Analysis of biomechanical parameters of muscle soleus contraction and blood biochemical parameters in rat with chronic glyphosate intoxication and therapeutic use of C60 fullerene.	International Journal of Molecular Sciences, (2021), Vol. 22, No. 9, Article No. 4977	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article presents an analysis of biomechanical and blood biochemical parameters in rat with chronic glyphosate intoxication and the use of C60 fullerene as effective nanotherapeutics in the treatment of glyphosate-based herbicide poisoning. This study provides useful information but does not alter the existing risk assessment. No information on the test material. Diet, housing and environmental conditions not described. Only one dose/no dose-effect relationship. No HCD.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
21	Pandher U. et al.	CA 5.8	2021	Pulmonary inflammatory response from co-exposure to LPS and glyphosate.	Environmental toxicology and pharmacology, (2021) Vol. 86, Article No. 103651	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article presents an evaluation of the pulmonary inflammatory response from co-exposure to LPS and glyphosate. This study provides useful information concerning to mode of action but does not alter the existing risk assessment. Purity of glyphosate not stated. Diet, housing and environmental conditions not described. One dose/no dose-effect relationship, no HCD.
38	Sanudi F. et al.	CP 10.2.2	2021	Effects of Glyphosate Herbicide on Physiological Parameters of Koi Carp, Cyprinus Carpio (Linnaeus, 1758) Fingerlings.	Indian Journal of Animal Research, (2021) Vol. 55, No. 3, pp. 266-270	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The study reports on chronic effects of glyphosate exposure to Koi carp (Cyprinus Carpio), incl. oxygen consumption rate, ammonia-nitrogen excretion rate, oxygen:nitrogen ratio and food consumption, over a duration of 28 days. The aforementioned parameters are not currently included in the context of an EU-level risk assessment. No ECx or NOEC values were reported (only a LOEC of 3.3. mg/L can be established). Therefore, the study can only be used as supplementary information. While the study reports on potentially relevant endpoints for the chronic toxicity to fish, the studies presents with a number of weaknesses due to which the study has to be deemd “not-reliable”. The most significant issues are listed in the following: The application of the test item is not specified, it is unclear whether a solvent carrier was used. Exposure concentrations were not analytically verified and since the test design was semi-static (medium exchange every 24h), the actual exposure concentrations could vary significantly from the nominal concentrations. Composition of the test medium was not reported, neither were the environmental conditions during the test. Furthermore, the exact number of organisms per treatment level and replicates per treatment level are not reported. Statistical methods were applied but not described, and since raw data are not reported it is impossible to assess the statistical power retroactively. Lastly, while there were effects on all assessed parameters compared to the control group, not all parameters responded in a clear dose dependent fashion.
33	Shiry N. et al.	CA 8.2.1, CP 10.2.1	2020	A bioassay on tissue cholinesterase activity of Rutilus kutum (Kamensky, 1901) exposed to some common pesticides in Iran.	Veterinary research forum : an international quarterly journal, (2020), Vol. 11, No. 4, pp. 325-331	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. While the study reports on regulatory relevant endpoints for the acute toxicity to fish, the reporting is lacking essential information to ascertain the reliability of the derived endpoints. The identity of the test item (whether the active substance or a formulated product) was not clearly reported, purity of the test item was not provided. The application of the test item is not specified, it is unclear whether a solvent carrier was used. Exposure concentrations were not analytically verified. Composition of the test medium was not reported, neither were the environmental conditions during the test. Furthermore, there is barely any information on the control group, no results are reported for the control and it is unclear if the control group consisted of the same number of individuals as the treatment groups. While LC50 and LOEC values are reported, there is no

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						information on the data distribution, goodness of fit or standard error. Raw data are not reported, hence it is impossible to assess the reliability of the reported endpoints. Overall, the study has do be deemed not reliable due to missing essential information in the report.
39	Strandberg B. et al.	CP 10.6	2021	Effects of glyphosate spray-drift on plant flowering.	Environmental pollution, (2021), Vol. 280, Article No. 116953	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study reports on spray-drift exposure of non-target plants to the glyphosate formulation Roundup Bio; 360 g a.i./L using tractor-mounted spray-drift reducing nozzles and effects on plant cover and flowering.While spray drift exposure is of relevance for the non-target plants (off-field) risk assessment, the effects assessed in this study (flowering and plant cover) are not currently taken into account in the context of an EU-level risk assessment. However, the study could be used in the context of a broader discussion regarding mitigation measures for the reduction of spray-drift exposure to non-target plants. The study reports on spray-drift exposure of non-target plants to the glyphosate formulation Roundup Bio; 360 g a.i./L using tractor-mounted spray-drift reducing nozzles and effects on plant cover and flowering. The study was deemed reliable with restrictions based on the following aspects: The tank solution contained a dye marker, sodium fluorescein, along with the glyphosate formulation. While the authors state that the substance has previously been used in tracer experiments, some including biological effects of pesticides, they also state that no publications on the effect of foliar application of sodium fluorescein on plants have been identified. Possible effects of the dye marker on the test plants can therefore not be excluded with certainty. Furthermore the results for estimated glyphosate spray drift deposition in relation to distance to edge of field and spray track are only reported in graphical form, which does not allow for derivation of exact values. The same goes for the effects on flowering in relation to glyphosate exposure. No raw data are reported.
29	Tittlemier S. A. et al.	CA 6.5	2020	Fate of glyphosate in wheat during milling and bread production. Focus Issue: Grain and grain-based food safety.	Cereal Chemistry, (2020), Vol. 98, No. 1, pp. 100-108	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Processing study of wheat from Canada; only glyphosate was detected, no residues of AMPA. On average, in the pearling process 50% of glyphosate resided in the outer 17% of the kernels, while in the milling process 81% of glyphosate in the wheat was associated with the bran, shorts, and feeds milling fractions. No changes in glyphosate concentration (corrected for moisture content) were observed during the preparation of dough, fermented dough, and bread. No endpoint is derived, this study is considered supportive for processing of wheat, however no clear processing factors can be derived. Restrictions include absence of validation data in different processed wheat matrices. For the analytical method it is referred to another publication (Tittlemier et al., 2017, Evaluation of a commercially available enzyme-linked immunosorbent assay and a liquid chromatography-tandem mass spectrometric method for the analysis of

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						glyphosate in wheat, oats, barley, malt, and lentils. Cereal Chemistry, 94, 1028-1036).
15	Upadhyay J. et al.	CA 5.6	2020	Teratogenic effect of chlorpyrifos and glyphosate on pregnant rats: biochemical and morphological evaluations.	Journal of Pharmaceutical Research International, (2020), Vol. 32, No. 23, Article No. JPRI.61413	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides information on teratogenic effects of glyphosate-based formulation Topper 77 (Crystal Crop Protection Pvt. Ltd India) which is nowhere close to the glyphosate representative EU formulation for AIR5. According to the webpage (https://www.crystalcropprotection.com/internationalsales/detail/Topper) it contains 71% of glyphosate and it is a SG-formulation. The representative glyphosate formulation for the AIR5 is a SL formulation and contains 360 g a.s./L. Due to formulation tested, the article is classified as relevant but supplementary. No information on purity, content and storage conditions of the test material. One dose level/no dose-effect relationship, no HCD reported.
13	Wozniak E. et al.	CA 5.4	2021	Glyphosate and AMPA Induce Alterations in Expression of Genes Involved in Chromatin Architecture in Human Peripheral Blood Mononuclear Cells (In Vitro).	International journal of molecular sciences, (2021), Vol. 22, No. 6	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides new information on the effect of glyphosate and the metabolite AMPA on expression of genes involved in chromatin architecture in human peripheral blood mononuclear cells (PBMCs). The results provide useful information on epigenetic processes that may be relevant but are difficult to interpret without further guidance. Therefore, the results are not expected to alter the existing risk assessment No HCD, no positive control. No real dose-effect relationship reported. The lack of positive control does not allow assessing the laboratory proficiency.
35	Yu H. et al.	CA 8.2.7.	2021	Effects of microplastics and glyphosate on growth rate, morphological plasticity, photosynthesis, and oxidative stress in the aquatic species Salvinia cucullata.	Environmental pollution, (2021), Vol. 279, Article No. 116900	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The study reports on effects of microplastics and glyphosate on growth rate, morphological plasticity, photosynthesis, and oxidative stress in the aquatic species Salvinia cucullata. Of all reported endpoints, only plant growth variables (relative growth rate (RGR), average specific leaf growth rate (ASLG), and yellow-leaf percentage (YLP)) are not on a molecular or cellular level and could be of potential relevance for an EU-level risk assessment for aquatic plants. It should be noted that currently no standardized test guideline for the testing of chemicals with Salvinia cucullata exists. Furthermore, no regulatory relevant endpoints were calculated (e.g. ECx) and the resuls were not presented in a way that would allow conducting such calculations retroactively. However, it can be inferred from the study that the NOEC for relative growth rate would be 25 mg glyphosate/L and this could therefore serve as supporting information in a regulatory context. While the study reports on endpoints with potential relevance to the regulatory risk assessment of aquatic plants, specifically growth rate, the study can not be deemed reliable due to issues with the test design as well as reporting of the data. The most significant aspects are listed in the following: The test plants were collected from a not specified natural habitat and previous contact with contaminants that could affect the outcome of the test can not be ruled out. The application of the test item is not described and it is unclear whether a solvent

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						carrier was used. If so, a solvent control would have to be included to dismiss possible toxic effects of the carrier. Exposure concentrations were not analytically verified. The test duration was 7 days without renewal of the test substance, the actual exposure concentrations could vary significantly from the nominal concentrations. Composition of the test medium was not reported. Furthermore, the results on growth rate are only reported in the form of a bar graph. Exact values can not be derived from the graph and statistical power can not be assessed. As no raw data are reported, statistical calculations can not be conducted retroactively. It has to be concluded that the study is not reliable for regulatory risk assessment purposes.

Table 36: Articles of unclear relevance (category C) after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
40	CA 5.8	Zhang L. et al.	2021	Involvement of mitochondrial fission in renal tubular pyroptosis in mice exposed to high and environmental levels of glyphosate combined with hard water.	Environmental pollution, (2021), Vol. 283, Article No. 117082	The relevance of this article is unclear (Category C) for the following reason: Although this publication provides information about involvement of mitochondrial fission in renal tubular pyroptosis in mice exposed to glyphosate combined with hard water, it is uncertain without further guidance, how these data can be related to the EU level regulatory risk assessment and how to interpret the data within the context of a renewal.
41	CA 5.8.2	Hu J. et al.	2021	Low-dose exposure of glyphosate-based herbicides disrupt the urine metabolome and its interaction with gut microbiota.	Scientific reports, (2021), Vol. 11, No. 1, Article No. 3265	The relevance of this article is unclear (Category C) for the following reason: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear.
42	CA 5.9	Franke A. A. et al.	2021	Pilot study on the urinary excretion of the glyphosate metabolite aminomethylphosphonic acid and breast cancer risk: The Multiethnic Cohort study.	Environmental pollution, (2021), Vol. 277, Article No. 116848	The relevance of this article is unclear (Category C) for the following reason: Exposure was presumably to AMPA, from uncertain sources. The population ivestigated were mostly post-menopausal women who were participants in the Hawaii biospecimen subcohort of the Multi-ethnic Cohort.
43	CA 5.9	Lesseur C. et al.	2021	Maternal urinary levels of glyphosate during pregnancy and anogenital distance in newborns in a US multicenter pregnancy cohort.	Environmental pollution, (2021), Vol. 280, Article No. 117002	The relevance of this article is unclear (Category C) for the following reason: First, it is unclear why the second trimester urine sample was selected for the analysis and whether it is representative of glyphosate and AMPA exposure during the etiologically relevant time period for affecting AGD. Second, it seems that chemicals and pesticides other than glyphosate were measured in urine (and blood) samples. Potential confounding from non-glyphosate exposures was not considered. Third, for female infants, there was a discrepancy between the results for the continuous and categorical analyses. In the former there were no significant results, while there were significant results in the categorical analyses. In general, dichotomizing at the median for highly positively skewed exposure variables does not create a clear exposure distinction between the groups being compared – both groups include primarily those with exposure values near the median. The discrepancy between the continuous and categorical analyses could be explained by those with the very highest exposure values having AGD similar to those with exposure values in the lower exposure group. It is obviously more informative to arrange comparison for groups that differ appreciably in the amount of exposure. Note also that there were no significant AGD findings for male infants. Lastly, the glyphosate and AMPA values are so low as to be of questionable biological plausibility given recent regulatory toxicology reviews for glyphosate and AMPA.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
44	CA 5.9	Meloni F. et al.	2021	Occupational exposure to glyphosate and risk of lymphoma:results of an Italian multicenter case-control study.	Environmental health : a global access science source, (2021), Vol. 20, No. 1, Article No. 49	The relevance of this article is unclear (Category C) for the following reason: This study is a very low quality case control study for evaluating glyphosate. The exposure to various formulations of pesticides was not described clearly, but likely exposure to multiple pesticides for those with relevant occupations (i.e. mixture toxicity). The authors only controlled for age, gender, study centre, and education. There was no control for exposures other than glyphosate.
45	CA 8.4	Anshu et al.	2020	Individual and combined toxic effects of herbicides on growth parameters and fecundity of Eisenia fetida	International Journal of Current Microbiology and Applied Sciences, (2020), Vol. 9, No. 12, pp. 1997-2005	The relevance of this article is unclear (Category C) for the following reason: No regulatory relevant endpoints are provided. In addition, results at 30, 60 and 90 days were provided, when the accepted time frame is 28 days (mortality and growth) and 56 days (reproduction) for Eisenia fetida. Earthworms were exposed to the test item all along the study period (90 days), while the agreed regulatory exposure period is of only 28 days (earthworms should have been removed after that). Therefore, the conclusions of the study are not comparable to any accepted regulatory endpoint. Thus its relevance remains unclear.
46	CP 10.4.2	Kozak V. M. et al.	2020	Influence of herbicides, insecticides and fungicides on food consumption and body weight of Rossiulus kessleri (Diplopoda, Julidae).	Biosystems Diversity, (2020), Vol. 28, No. 3, pp. 272-280	The relevance of this article is unclear (Category C) for the following reason: The study assesses the effects of a glyphosate formulation (Roundup, 450 g/L, IPA salt) on body weight, food consumption and production of feces of Russilus kessleri, a millipede (Diplopoda, Julidae), over a duration of 20 days. No endpoints relevant to the risk assessment were reported, as no reproduction effects were investigated. While soil-dwelling organisms are relevant for the EU level risk assessment, the species Russilus kessleri is not commonly used as a representative species for soil organisms. Furthermore, the described test system is not in accordance with the standardized test systems for soil organisms, as no soil was included in the test system, only dried litter. In addition, the test organisms were collected in the wild from a not specified source ("near an airport"), so previous contaminant exposure can not be ruled out.

Table 37: Articles of unclear relevance (category C) after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
45	Anshu et al.	CA 8.4	2020	Individual and combined toxic effects of herbicides on growth parameters and fecundity of Eisenia fetida	International Journal of Current Microbiology and Applied Sciences, (2020), Vol. 9, No. 12, pp. 1997-2005	The relevance of this article is unclear (Category C) for the following reason: No regulatory relevant endpoints are provided. In addition, results at 30, 60 and 90 days were provided, when the accepted time frame is 28 days (mortality and growth) and 56 days (reproduction) for Eisenia fetida. Earthworms were exposed to the test item all along the study period (90 days), while the agreed regulatory exposure period is of only 28 days (earthworms should have been removed after that). Therefore, the conclusions of the study are not comparable to any accepted regulatory endpoint. Thus its relevance remains unclear.
42	Franke A. A. et al.	CA 5.9	2021	Pilot study on the urinary excretion of the glyphosate metabolite aminomethylphosphonic acid and breast cancer risk: The Multiethnic Cohort study.	Environmental pollution, (2021), Vol. 277, Article No. 116848	The relevance of this article is unclear (Category C) for the following reason: Exposure was presumably to AMPA, from uncertain sources. The population ivestigated were mostly post-menopausal women who were participants in the Hawaii biospecimen subcohort of the Multi-ethnic Cohort.
41	Hu J. et al.	CA 5.8.2	2021	Low-dose exposure of glyphosate-based herbicides disrupt the urine metabolome and its interaction with gut microbiota.	Scientific reports, (2021), Vol. 11, No. 1, Article No. 3265	The relevance of this article is unclear (Category C) for the following reason: Potential effects to gut microbes are not part of the EU risk assessments. Suitable scientific approaches to assess effects are not specified, thus relevance of the effects remained unclear.
46	Kozak V. M. et al.	CP 10.4.2	2020	Influence of herbicides, insecticides and fungicides on food consumption and body weight of Rossiulus kessleri (Diplopoda, Julidae).	Biosystems Diversity, (2020), Vol. 28, No. 3, pp. 272-280	The relevance of this article is unclear (Category C) for the following reason: The study assesses the effects of a glyphosate formulation (Roundup, 450 g/L, IPA salt) on body weight, food consumption and production of feces of Russilus kessleri, a millipede (Diplopoda, Julidae), over a duration of 20 days. No endpoints relevant to the risk assessment were reported, as no reproduction effects were investigated. While soil-dwelling organisms are relevant for the EU level risk assessment, the species Russilus kessleri is not commonly used as a representative species for soil organisms. Furthermore, the described test system is not in accordance with the standardized test systems for soil organisms, as no soil was included in the test system, only dried litter. In addition, the test organisms were collected in the wild from a not specified source ("near an airport"), so previous contaminant exposure can not be ruled out.
43	Lesseur C. et al.	CA 5.9	2021	Maternal urinary levels of glyphosate during pregnancy and anogenital distance in newborns in a US multicenter pregnancy cohort.	Environmental pollution, (2021), Vol. 280, Article No. 117002	The relevance of this article is unclear (Category C) for the following reason: First, it is unclear why the second trimester urine sample was selected for the analysis and whether it is representative of glyphosate and AMPA exposure during the etiologically relevant time period for affecting AGD. Second, it seems that chemicals and pesticides other than glyphosate were measured in urine (and blood) samples. Potential confounding from non-glyphosate exposures was not considered. Third, for female infants, there was a discrepancy between the results for the continuous and categorical analyses. In the former there were no

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
						significant results, while there were significant results in the categorical analyses. In general, dichotomizing at the median for highly positively skewed exposure variables does not create a clear exposure distinction between the groups being compared – both groups include primarily those with exposure values near the median. The discrepancy between the continuous and categorical analyses could be explained by those with the very highest exposure values having AGD similar to those with exposure values in the lower exposure group. It is obviously more informative to arrange comparison for groups that differ appreciably in the amount of exposure. Note also that there were no significant AGD findings for male infants. Lastly, the glyphosate and AMPA values are so low as to be of questionable biological plausibility given recent regulatory toxicology reviews for glyphosate and AMPA.
44	Meloni F. et al.	CA 5.9	2021	Occupational exposure to glyphosate and risk of lymphoma:results of an Italian multicenter case-control study.	Environmental health : a global access science source, (2021), Vol. 20, No. 1, Article No. 49	The relevance of this article is unclear (Category C) for the following reason: This study is a very low quality case control study for evaluating glyphosate. The exposure to various formulations of pesticides was not described clearly, but likely exposure to multiple pesticides for those with relevant occupations (i.e. mixture toxicity). The authors only controlled for age, gender, study centre, and education. There was no control for exposures other than glyphosate.
40	Zhang L. et al.	CA 5.8	2021	Involvement of mitochondrial fission in renal tubular pyroptosis in mice exposed to high and environmental levels of glyphosate combined with hard water.	Environmental pollution, (2021), Vol. 283, Article No. 117082	The relevance of this article is unclear (Category C) for the following reason: Although this publication provides information about involvement of mitochondrial fission in renal tubular pyroptosis in mice exposed to glyphosate combined with hard water, it is uncertain without further guidance, how these data can be related to the EU level regulatory risk assessment and how to interpret the data within the context of a renewal.

Table 38: Articles excluded after detailed assessment (i.e. not relevant): sorted by technical section (and by author)

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
47	Ecotoxicology	Canosa I. S. et al.	2021	In vitro Interference of a Glyphosate Commercial Formulation with the Stimulation of Ovarian Maturation by Progesterone, in the Estuarine Crab Neohelice granulata.	Bulletin of environmental contamination and toxicology, (2021), Vol. 106, No. 4, pp. 583-588	The article has been classified as not relevant by full text for the following reason: Roundup Ultramax is not the representative formulation for the glyphosate EU renewal. In addition it contains etheralkylamine ethoxylate (https://www.raiffeisen.com/agrar_sdb/111/ebb9b8dd2b70ad89b50c16a5dc67ec50?variante=), which does have a similar structure to POEA. Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure, are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal.
48	Ecotoxicology	Castelli L. et al.	2021	Impact of Chronic Exposure to Sublethal Doses of Glyphosate on Honey Bee Immunity, Gut Microbiota and Infection by Pathogens.	Microorganisms, (2021), Vol. 9, No. 4	The article has been classified as not relevant by full text for the following reason: This study evaluates the effects of non-lethal doses of glyphosate (0.1 µg/bee/d) on gut microbiota, immune response and lifespan of honeybees (Apis mellifera hybrids). These findings are largely based on cellular/molecular level and cannot be related to the risk assessment. The data on the bees lifespan cannot be expressed in the form of an endpoint relevant to the risk assessment as only one treatment concentration was tested. Overall, it can be concluded that the generated outcomes are not relatable to the EU level risk assessment.
49	Ecotoxicology	Cruz Souza C. E. et al.	2021	Physiological and morphoanatomical effects of glyphosate in Eugenia uniflora, a Brazilian plant species native to the Atlantic Forest biome.	Environmental science and pollution research international, (2021), Vol. 28, No. 17, pp. 21334-21346	The article has been classified as not relevant by full text for the following reason: Roundup Ultra is not the representative formulation for the glyphosate EU renewal. The surfactant system in the formulated product used in this study was not specified by the author. It is therefore not possible to confirm whether the product used contained POEA surfactant / surfactants of similar chemical structure. Glyphosate based formulations that contain POEA surfactants / surfactants of similar chemical structure, are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) / surfactants with similar structure, may lead to enhanced sensitivity. For this reason and the fact that it is unclear whether the formulated product contained POEA / surfactants of similar chemical structure, the article is not considered relevant for use in risk assessment. In addition, it seems that Roundup Ultra is a WG formulation (http://www.roundup.com.br/produtos-da-familia-roundup). The representative formulation for the glyphosate EU renewal is a SL formulation.
50	Ecotoxicology	Davico C. E. et al.	2021	Reproductive toxicity of Roundup WG (R) herbicide: impairments in	Environmental Science and Pollution Research International, (2021), Vol. 28, No. 12	The article has been classified as not relevant by full text for the following reason: Roundup WG is not the representative formulation for the glyphosate EU renewal. The representative formulation for the glyphosate EU renewal is MON 52276, which has a nominal glyphosate acid equivalent (a.e.) content of 360 g/L, formulated using glyphosate isopropyl-ammonium

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
				ovarian follicles of model organism Danio rerio.		salt and a quaternary-ammonium based surfactant. In addition, MON 52276 is a SC formulation whereas Roundup tested in this study is a WG formulation. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. As co-formulants were not identified in this paper, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal.
51	Ecotoxicology	Díaz-Martín R. D. et al.	2021	Changes in microtubule stability in zebrafish (Danio rerio) embryos after glyphosate exposure.	Heliyon, (2021), Vol. 7, No. 1, Article No. E06027	The article has been classified as not relevant by full text for the following reason: This study evaluates the effects of glyphosate on microtubule stability in zebrafish embryos (Danio rerio). These findings are based on molecular/cellular level effects and cannot be related to the risk assessment. Overall, it can be concluded that the generated outcomes are not relatable to the EU level risk assessment.
52	Ecotoxicology	Galon L. et al.	2020	Damage to lemon tree caused by simulated drift of herbicides.	Revista de Ciencias Agroveterinarias, (2020), Vol. 19, No. 3, pp. 319-328	The article has been classified as not relevant by full text for the following reason: Effects on local (non-European) species under tropical/ subtropical environmental- resp. agricultural conditions. Effects observed in this greenhouse study conducted in Brazil are not easily transferrable to European conditions, not relevant for the risk assessment. In addition Roundup Original tested in this study is not the representative formulation for the glyphosate EU renewal (the representative formulation is MON 52276). Moreover, it contains POEA surfactants that is not permitted for use in formulated herbicidal products in the EU. Therefore, the findings of this paper are not relevant to the regulatory risk assessment for the glyphosate EU renewal.
53	Ecotoxicology	Glinski D. A. et al.	2021	Route of exposure influences pesticide body burden and the hepatic metabolome in post-metamorphic leopard frogs.	The Science of the total environment, (2021), Vol. 779, Article No. 146358	The article has been classified as not relevant by full text for the following reason: This study evaluates the effects of glyphosate exposure on the hepatic metabolome of post-metamorphic southern leopard frogs (L. sphenocephala). These findings are based on molecular/cellular level effects and cannot be related to the risk assessment. The parameter body burden was not assessed for glyphosate. Overall, it can be concluded that the generated outcomes are not relatable to the EU level risk assessment.
54	Ecotoxicology	Korkmaz V. et al.	2021	The bioremediation of glyphosate in soil media by some newly isolated bacteria: The COD, TOC removal efficiency and mortality assessment for Daphnia magna.	Environmental Technology & Innovation, (2021), Vol. 22, Article No. 101535.	The article has been classified as not relevant by full text for the following reason: It is not possible to confirm the identity of the glyphosate based herbicide used in the study as only "Glyphosate, 480 gr of active material" is mentioned. The surfactant system in the formulated product used in this study was also not specified by the authors. The composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. Given this uncertainty over what was tested in this study, the paper is not considered relevant to the glyphosate EU renewal.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
55	Ecotoxicology	Lacava M. et al.	2021	pest-specific effects of glyphosate on functional response of a wolf spider.	Chemosphere, (2021), Vol. 262, Article No. 127785	The article has been classified as not relevant by full text for the following reason: It is not possible to confirm the identity of the test item used in the study as only 'Roundup' is mentioned. Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contained POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure. The surfactant system in the formulated product used in this study was also not specifed by the author. Given this uncertainty over what was tested in this study, the paper is not considered relevant to the glyphosate EU renewal.
56	Ecotoxicology	Martinez-Garcia L. B. et al.	2021	Litter quality drives nitrogen release, and agricultural management (organic vs. conventional) drives carbon loss during litter decomposition in agro-ecosystems.	SOIL BIOLOGY & BIOCHEMISTRY, (2021), Vol. 153, Article No. 108115	The article has been classified as not relevant by full text for the following reason: It is not possible to confirm the identity of the test item used in the study as only 'Roundup' is mentioned. Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contained POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure. The surfactant system in the formulated product used in this study was also not specifed by the author. Given this uncertainty over what was tested in this study, the paper is not considered relevant to the glyphosate EU renewal.
57	Ecotoxicology	Owagboriaye F. et al.	2021	Impacts of a glyphosate-based herbicide on the gut microbiome of three earthworm species (Alma millsoni, Eudrilus eugeniae and Libyodrilus violaceus): A pilot study.	Toxicology reports, (2021), Vol. 8, pp. 753-758	The article has been classified as not relevant by full text for the following reason: This study investigated the impact of a glyphosate formulation (Roundup Alphée; 7.20 g/L) on the gut microbial communities of three earthworm species (Alma millsoni, Eudrilus eugeniae and Libyodrilus violaceus). The findings are based on molecular/cellular level effects and cannot be related to the risk assessment. In addition, the publication is not dealing with EU representative conditions as the tested species and soils used are native to Africa. Overall, it can be concluded that the generated outcomes are not relatable to the EU level risk assessment.
58	Ecotoxicology	Parlapiano I. et al.	2021	Effects of commercial formulations of glyphosate on marine crustaceans and implications for risk assessment under temperature changes.	Ecotoxicology and environmental safety, (2021), Vol. 213, Article No. 112068	The article has been classified as not relevant by full text for the following reason: None of the glyphosate formulations tested is the representative formulation for the glyphosate EU renewal. The representative formulation for the glyphosate EU renewal is MON 52276, which has a nominal glyphosate acid equivalent (a.e.) content of 360 g/L, formulated using glyphosate isopropyl-ammonium salt and a quaternary-ammonium based surfactant. Moreover, it is unclear whether the formulations tested contained POEA or not. In the discussion part of this paper, the author states that "Formulations vary between different brands and between different countries. These are cocktails of chemicals composed by glyphosate as active principle (36-48%), water, salts, and co-formulants such as polyoxyethylene tallow amine (POEA). Formulations with POEA are relatively toxic compared to other formulations (Mesnage et al., 2013; Mesnage and Antoniou, 2018)." This statement adds uncertainty concerning the relevance of the findings in the paper to the EU renewal of glyphosate. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						For this reason and the uncertainties associated with the product tested (surfactant system not specified, may contain POEA -> POEA based surfactants are not to be used in agrochemical products in the EU), the article is not considered relevant for use in risk assessment.
59	Ecotoxicology	Portinho J. L. et al.	2021	Resting egg banks can facilitate recovery of zooplankton communities after short exposure to glyphosate.	Ecotoxicology, (2021), Vol. 30, No. 3, pp. 492-501	The article has been classified as not relevant by full text for the following reason: The study does report on short-term viability and recovery of zooplankton communities after exposure to glyphosate. However, the study design, test system and species tested (study conducted in Brazil with native, wild sampled organisms) are not relevant for the European regulatory purposes. The study design does not resemble any test currently used in a regulatory context and no regulatory relevant endpoints can be derived from this study.
60	Ecotoxicology	Rodriguez-Miguel A. et al.	2021	Exposure to sublethal concentrations of the glyphosate-based herbicide Faena® increases sensitivity in the progeny of the American cladoceran Daphnia exilis (Herrick, 1895).	Environmental science and pollution research international, (2021) : Ahead of Print	The article has been classified as not relevant by full text for the following reason: The glyphosate formulation tested is the representative formulation for the glyphosate EU renewal. The representative formulation for the glyphosate EU renewal is MON 52276, which has a nominal glyphosate acid equivalent (a.e.) content of 360 g/L, formulated using glyphosate isopropyl-ammonium salt and a quaternary-ammonium based surfactant. Moreover, it is unclear whether the formulation tested contained POEA or not. In the introduction of this paper, the author states that “Polyoxyethylene tallow amine (POEA) is a common surfactant included in glyphosate-based herbicides; it is assumed to be the main responsible for the toxicity of the commercial products in some aquatic organisms (Perkins et al. 2000; Thompson et al. 2004)." This statement adds uncertainty concerning the relevance of the findings in the paper to the EU renewal of glyphosate. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason and the uncertainties associated with the product tested (surfactant system not specified, may contain POEA -> POEA based surfactants are not to be used in agrochemical products in the EU), the article is not considered relevant for use in risk assessment.
61	Ecotoxicology	Sanchez Albanil J. A. et al.	2021	Glyphosate-based herbicides affect behavioural patterns of the livebearer Jenynsia multidentata.	Environmental science and pollution research international, (2021) : Ahead of Print	The article has been classified as not relevant by full text for the following reason: None of the glyphosate formulations tested is the representative formulation for the glyphosate EU renewal. The representative formulation for the glyphosate EU renewal is MON 52276, which has a nominal glyphosate acid equivalent (a.e.) content of 360 g/L, formulated using glyphosate isopropyl-ammonium salt and a quaternary-ammonium based surfactant. Moreover, Roundup Original (RO) and Roundup Transorb (RT) contain POEA (stated by the authors in the Materials and methods part of the paper "RO is a liquid formulation composed of glyphosate isopropylamine salt (IPA) (480 g/L), glyphosate acid equivalent (360 g/L GlyAE) and surfactant MON 0818, the Monsanto code for the POEA designation. RT is also a liquid made from glyphosate isopropylamine salt (IPA), but at 648 g/L, glyphosate acid equivalent, at 480 g/L GlyAE, and POEA.). The 3rd formulation tested was Roundup RWG which is a granular formulation. The representative formulation for the glyphosate EU renewal is a soluble concentrate (SL) The composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example,

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity.For this reason and the fact that POEA based surfactants are not to be used in agrochemical products in the EU, the article is not considered relevant for use in risk assessment.
62	Ecotoxicology	Straw E. A. et al.	2021	Roundup causes high levels of mortality following contact exposure in bumble bees.	JOURNAL OF APPLIED ECOLOGY, (2021) : Ahead of Print	The article has been classified as not relevant by full text for the following reason: The products used in the study are not related to the representative formulation for the glyphosate EU renewal. 'Roundup No glyphosate' contains 'acetic acid' only. 'Weedol' is a mixture of glyphosate and pyraflufen-ethyl and 'Roundup Ready-To-Use' is a mixture of glyphosate and pelargonic acid (effects observed cannot be attributed to the substance of concern, i.e. mixture toxicity). The surfactant system used in 'Roundup ProActive is alkyl polysaccharide + nitronyl based, whereas the surfactant used in the representative formulation (MON 52276) for the glyphosate EU renewal is quaternary-ammonium based. The composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal. Further points for clarification: • The authors acknowledge in the paper that tier methodology is not designed to replicate field realistic exposure (spraying conditions or label recommended application rates), it is instead designed to assess the lethality (hazard) the herbicide products pose to bumble bees. • The results from this study are not surprising considering that the bees were confined and directly sprayed with high volumes of the formulations and in some instances at application rates that greatly exceeded registered rates. • It cannot be concluded from this study that there will be unacceptable risk to bees from applications of lawn and garden and agricultural Roundupâ formulations when used according to the label. Users should always read the label and use pesticides safely. • For example, the label for Roundup Speed Ultra, which only contains acetic acid and water, states that the formulation is dangerous to bees and to protect bees and pollinating insects do not apply to plants when in flower, do not use where bees are actively foraging, and do not apply when flowering weeds are present. • Lawn and garden products are intended for spot applications, to the leaves of plants, and are not intended to be directly applied to insects, including bees. • Contact toxicity studies with bees, following the established OECD 214 test guideline used to assess acute contact toxicity to bees, have demonstrated no unacceptable risk for the lawn and garden and agricultural formulations to bees. • EFSA in their recent renewal assessment report for glyphosate, concluded that glyphosate and the representative formulation pose negligible acute and chronic risk to larval and adult bees (EFSA, 2015).
63	Ecotoxicology	Sylwestrzak Z. et al.	2021	Ecotoxicological Studies on the Effect of Roundup(®) (Glyphosate Formulation) on Marine Benthic	International journal of environmental research and public health, (2021), Vol. 18, No. 3	The article has been classified as not relevant by full text for the following reason: It is not possible to confirm the identity of the test item used in the study as only 'Roundup' is mentioned. Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contained POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure. POEA surfactant was discussed on

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
				Microalgae.		multiple occasions in the paper. These statements add uncertainty concerning the relevance of the findings in the paper to the EU renewal of glyphosate. Given this uncertainty over what was tested in this study, the paper is not considered relevant to the glyphosate EU renewal.
64	Ecotoxicology	Szabo R. et al.	2020	Toxicity test of individual and combined toxic effects of glyphosate herbicide and heavy metals on chicken embryos.	AGROFOR International Journal, (2020), Vol. 5, No. 3, pp. 64-71	The article has been classified as not relevant by full text for the following reason: Glialka Star is not the representative formulation for the glyphosate EU renewal. In addition it contains etheralkylamine ethoxylate (https://www.gazdabolt.hu/gyomirto-szer/1710-glialka-star-1-l.html; under "Dokumentok"), which does have a similar structure to POEA. Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure, are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal.
65	Ecotoxicology	Zeng H. et al.	2021	Physiological and metagenomic strategies uncover the rhizosphere bacterial microbiome succession underlying three common environmental stresses in cassava.	Journal of hazardous materials, (2021), Vol. 411, Article No. 125143	The article has been classified as not relevant by full text for the following reason: The study reports on dynamics of rhizosphere bacterial microbiome of cassava under glyphosate exposure. The reported results are entirely on a molecular or cellular level and are hence not relatable to the EU level risk assessment. Cassava plant growth is also reported, but only graphically and it is not the scope of the publication. The study is therefore considered non-relevant.
66	Fate and behaviour in the environment	Hartmann A. et al.	2021	Risk of groundwater contamination widely underestimated because of fast flow into aquifers.	Proceedings of the National Academy of Sciences of the United States of America, (2021), Vol. 118, No. 20, Article No. e2024492118	The article has been classified as not relevant by full text for the following reason: A continental-scale model to quantify the risk of groundwater contamination with glyphosate and other compounds in the carbonate rock regions of Europe, North Africa and the Middle East was developed. The consistency of the model for glyphosate was evaluated with US data. The article does not report any measured data. The model results were qualitatively compared with referenced literature data for US, Switzerland and Ireland.
67	Residues in or on treated products, food and feed	Cebotari V., Buzu I.	2020	Conformity of rapi, peas and maize flowers, concerning pesticide residues for organic beekeeping.	Scientific Papers, Series D. Animal Science, (2020), Vol. 63, No. 1, pp. 415-421	The article has been classified as not relevant by full text for the following reason: Monitoring of flowers of rape, pea and maize flowers for residues of glyphosate in Moldova (1 sampling site per crop, 5 replicate samples per crop). Glyphosate was detected in all samples. The study is not reliable: No description of the analytical procedure and no analytical validation data. In addition, the publication cannot be used to derive an endpoint. Furthermore, since the dataset is far too small to be considered representative of a country or region and since the agricultural practice at the sampling sites is not reported, the data are not usable or supportive for regulatory evaluations.
68	Residues in or on treated products, food and feed	Taghizadeh S. F. et al.	2021	Residues levels of pesticides in walnuts of Iran and associated health risks.	Human and Ecological Risk Assessment, (2021), Vol. 27, No. 1	The article has been classified as not relevant by full text for the following reason: Monitoring data from Iran on pesticides in walnuts (sampling from 5 sites). Glyphosate was detected in samples from 4 sites (no information provided on sample size, residue range in mg/kg). The study is not reliable and thus not relevant: It is unclear what was analysed: "Green husk and

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						hard shells of walnuts were separated and then homogenized". Analytical method used was GC/MS. Extraction with acetonitrile. No information on how glyphosate is used in nut orchards. Sample size and residue levels not provided in tabular form. Unclear statistics which cannot be reproduced.
69	Residues in or on treated products, food and feed	Tiurina D. G. et al.	2021	Glyphosate in diets for poultry.	Ptitsevodstvo, (2021), No. 3, pp. 27-30	The article has been classified as not relevant by full text for the following reason: Very limited information on glyphosate in poultry feed. One in-vitro experiment with baceria (Bacillus megaterium) incubation on glyphosate containing medium, only very limited description. The study is not reliable and thus not relevant: Poorly described study with some poultry feed monitoring data and an irrelevant in-vitro assay on bacterial degradation of glyphosate. The exact nature/composition of the analysed samples is not given. There is no information to assess the accuracy of the residue determination.
70	Toxicology and metabolism	Cardoso M. F. C. et al.	2021	Cardiovascular damage associated with subchronic exposure to the glyphosate herbicide in Wistar rats.	Toxicology and industrial health, (2021), Vol. 37, pp. 210-218	The article has been classified as not relevant by full text for the following reason: The publication is dealing with a glyphosate formulation Roundup Original. It is known that this formulation contains POEA. The representative formulation for the glyphosate AIR5 does not contain POEA. POEA is banned in the EU. Thus the paper is not relevant to the EU glyphosate renewal. In addition, the publication does not provide any relevant information to be used in the risk assessment. There are no HCD to understand the relevance of the observed increase of fatty streaks. The conclusion of glyphosate atherogenic potential is not supported either by other correlated histopathology findings and/or appropriated biomarker of atherogenic risk.
71	Toxicology and metabolism	Panza S. B. et al.	2021	Perinatal exposure to low doses of glyphosate-based herbicide combined with a high-fat diet in adulthood causes changes in the jejunums of mice.	Life sciences, (2021), Vol. 275, Article No. 119350	The article has been classified as not relevant by full text for the following reason: The publication is dealing with a glyphosate formulation Roundup Original. It is known that this formulation contains POEA. The representative formulation for the glyphosate AIR5 does not contain POEA. POEA is banned in the EU. Thus the paper is not relevant to the EU glyphosate renewal.
72	Toxicology and metabolism	Romano R. M. et al.	2021	Could Glyphosate and Glyphosate-Based Herbicides Be Associated With Increased Thyroid Diseases Worldwide?	Frontiers in endocrinology, (2021), Vol. 12, Article No. 627167	The article has been classified as not relevant by full text for the following reason: This article is a review of other publications. No study developed for glyphosate in this documents. This article is not relevant for risk assessment and does not bring any new information to the renewal dossier.
73	Toxicology and metabolism	Stewart B. W. et al.	2021	Enhanced communication of IARC Monograph findings to better achieve public health outcomes.	CARCINOGENESIS, (2021), Vol. 42, No. 2, pp. 159-168	The article has been classified as not relevant by full text for the following reason: The article is a summary of keywords to be used to improve communication to reach public health outcomes. No study developed for glyphosate in this documents. This article is not relevant for risk assessment and does not bring any new information to the renewal dossier.
74	Toxicology and metabolism	Wang R. et al.	2021	Renal tubular injury induced by glyphosate combined with hard water: the role of cytosolic phospholipase A2.	Annals of translational medicine, (2021), Vol. 9, No. 2, Article No. 130	The article has been classified as not relevant by full text for the following reason: This publication suggests renal tubulary injury induced by glyphosate based formulation containing POEA surfactant combined with hard water. However, these data were obtained at excessively high doses of POEA surfactant, which are not relevant the EU level regulatory review. The lack of substantial body weight loss and potentially mortality at these exceedingly high POEA oral exposures for 90-days are not consistent with data published in the US EPA assessment

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						for this POEA surfactant, with a NOAEL of 33 mg/kg bw/day and 39 mg/kg bw/day in males/females, respectively, and LOAEL of 99 mg/kg bw/day and 123 mg/kg bw/day in males/females, respectively (US EPA, 2009. Alkyl amine polyalkoxylates Human Health Risk Assessment, pages 58 and 59 of 94). Therefore, any findings are likely a consequence of overt toxicity to the gastrointestinal tract of treated animals. Furthermore, key study details on feed and water consumption are lacking, and as such the results are difficult to place in context relative to these key indicators of animal health.

Appendix 1: AGG ADVICE on how to present the literature search in the dossier

ASSESSMENT GROUP ON GLYPHOSATE (AGG)

October 2019

ADVICE TO GTF2:
HOW TO PRESENT THE LITERATURE SEARCH
IN THE DOSSIER TO BE SUBMITTED JUNE 2020

The literature search should be carried out and presented as recommended in the EFSA Guidance EFSA Journal 2011;9(2):2092) including its recently published Appendix, available at the EFSA Journal.

Rapid assessment of titles/abstracts:
Articles that are considered as **not relevant**:

Not necessary to submit articles or study summaries but justification needed at a general level, i.e. criteria used to classify references as being clearly non-relevant.

Detailed assessment of full text of articles:
Articles that are considered as **not relevant**
or
considered **not reliable**:

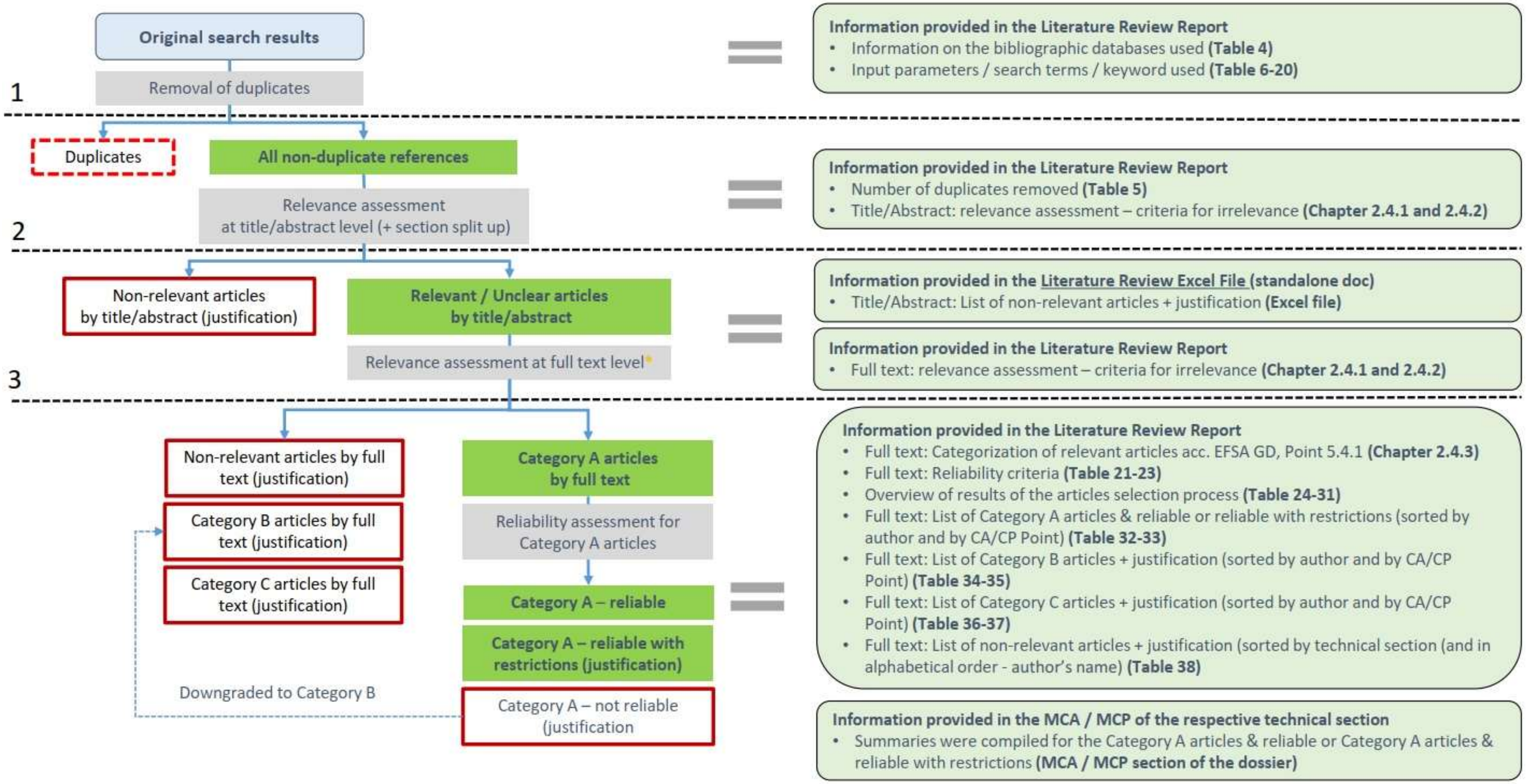
Necessary to submit articles and statement with the reason of rejection (no study summaries).

Detailed assessment of full text of articles:
Articles considered as **relevant and reliable**:

Necessary to submit articles. A detailed study summary should be provided in the relevant section of Doc MCA/MCP.

For presentation of detailed study summary, reference is made to EFSA Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances (27 March 2019, doi: 10.2903/sp.efsa.2016.EN-1612).

Appendix 2: The process of articles selection



* All articles (and their translations) evaluated at full-text level (detailed assessment) are submitted to the AGG.

Appendix 3: ORIGINAL SEARCH QUERY - January 2021 – 14 May 2021

Preparing the search queries on STN:

```
    FILE 'STNGUIDE' ENTERED AT 12:26:50 ON 13 MAY 2021
CHARGED TO COST=113898
L1          QUE SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
            GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
            5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
            69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
            OR 1066-51-9
            SAVE TEMP L1 GLY1/Q
L2          QUE SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
            ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
            AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
             PHOSPHONIC ACID OR 57637-97-5
            SAVE TEMP L2 GLY2/Q
L3          QUE SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
            IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
            C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
            YDROXYMETHYL OR PHOSPHONOMETHANOL
L4          QUE SPE=ON  ABB=ON  PLU=ON  HYDROXYMETHYLPHOSPHONATE OR
            HYDROXYMETHYLPHOSPHONIC ACID
L5          QUE SPE=ON  ABB=ON  PLU=ON  L3 OR L4
            SAVE TEMP L5 GLY3/Q
L6          QUE SPE=ON  ABB=ON  PLU=ON  35404-71-8 OR METHYLAMINO METHYL
            PHOSPHONIC ACID OR METHYLAMINOMETHYL PHOSPHONIC ACID OR
            METHYLAMINOMETHYLPHOSPHONIC ACID OR N METHYL AMPA OR NSC
            244826 OR PHOSPHONIC ACID METHYLAMINO METHYL OR PHOSPHONIC
            ACID P METHYLAMINO METHYL
L7          QUE SPE=ON  ABB=ON  PLU=ON  2 3 DIHYDROXY 1 OXOPROPYL AMINOMETH
            YL PHOSPHONIC ACID OR 2 3 DIHYDROXY 1 OXOPROPYL AMINOMETHYLPHOS
            PHONIC ACID OR N GLYCERYL AMPA
L8          QUE SPE=ON  ABB=ON  PLU=ON  3 OXO 3 PHOSPHONOMETHYL AMINO
            PROPANOIC ACID OR 3 OXO 3 PHOSPHONOMETHYL AMINOPROPANOIC ACID
            OR N MALONYL AMPA
L9          QUE SPE=ON  ABB=ON  PLU=ON  993-13-5 OR DIHYDROGEN METHYLPHOSPH
            ONATE OR METHANEPHOSPHONIC ACID OR METHYL PHOSPHONIC ACID OR
            METHYLPHOSPHONIC ACID OR NSC 119358 OR PHOSPHONIC ACID METHYL
            OR PHOSPHONIC ACID P METHYL
L10         QUE SPE=ON  ABB=ON  PLU=ON  (L6 OR L7 OR L8 OR L9)
            SAVE TEMP L10 GLY4/Q
L11         QUE SPE=ON  ABB=ON  PLU=ON  24569-83-3 OR 2 METHYL PHOSPHONOMET
            HYL AMINO ACETIC ACID OR 2 METHYL PHOSPHONOMETHYL AMINOACETIC
            ACID OR ACETIC ACID 2 N METHYL N PHOSPHONATOMETHYL AMINO OR
            GLYCINE N METHYL N PHOSPHONOMETHYL OR GLYPHOSATE N METHYL OR
            METHYL GLYPHOSATE
L12         QUE SPE=ON  ABB=ON  PLU=ON  METHYL PHOSPHONOMETHYL AMINO
            ACETIC ACID OR METHYL PHOSPHONOMETHYL AMINOACETIC ACID OR N
            METHYL N PHOSPHONOMETHYL GLYCINE OR N METHYLGLYPHOSATE OR N
            PHOSPHONOMETHYL N METHYL GLYCINE OR N PHOSPHONOMETHYL N
            METHYLGLYCINE
L13         QUE SPE=ON  ABB=ON  PLU=ON  (L11 OR L12)
            SAVE TEMP L13 GLY5/Q
L14         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
            HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
            IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
            EYE? OR IRRIT? OR SENSI? OR ALLERG?
L15         QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
            GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
            METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
            ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L16         QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
            CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
            OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
            OR HORMON? OR GONAD? OR DISRUPT?
L17         QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
            MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
            PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
            EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
            OCCUPAT?
L18         QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
            MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
            CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
            RISK ASSESSMENT?
L19         QUE SPE=ON  ABB=ON  PLU=ON  (L14 OR L15 OR L16 OR L17 OR L18)
            SAVE TEMP L19 TOX/Q
L20         QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
            OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
            METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
            MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L21         QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
            PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
            HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
            OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L22         QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
            OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L23         QUE SPE=ON  ABB=ON  PLU=ON  (L20 OR L21 OR L22)
            SAVE TEMP L23 RES/Q
L24         QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
            DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
            SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
            AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L25         QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
             OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
            OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
            ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L26         QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
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         PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
         HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
         MOVEMENT OR REMOVAL OR DRINKING WATER OR WATER TREATMENT
         PROCESSES
L27        QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
         NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
         OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
         OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
         PERSISTENCE OR LIGAND
L28        QUE SPE=ON  ABB=ON  PLU=ON  (L24 OR L25 OR L26 OR L27)
         SAVE TEMP L28 FATE/Q
L29        QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
         ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
         BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
         EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT? OR BIODIVERS? OR
         PROTECTION GOALS OR ECO?
L30        QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
         OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
         OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
         OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
         OR ALG? OR CHIRON?
L31        QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
         LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
         INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
         APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L32        QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L33        QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
         FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
         RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
         ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
         PARASITOID
L34        QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
         OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
         OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
         MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
         NITROGEN
L35        QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
         SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
         ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
         OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
L36        QUE SPE=ON  ABB=ON  PLU=ON  (L29 OR L30 OR L31 OR L32 OR L33
         OR L34 OR L35)
         SAVE TEMP L36 ECO/Q

 SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 12:37:35 ON 13 MAY 2021
```

Final search - Update May 2021:

```
   FILE 'MEDLINE' ENTERED AT 11:33:55 ON 14 MAY 2021
CHARGED TO COST=113898
L1      4624 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L2       183 S L1 AND ED>20210104
L3       181 S L2 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
         SAVE TEMP L3 GLYMEDL/A

   FILE 'AGRICOLA' ENTERED AT 11:37:05 ON 14 MAY 2021
CHARGED TO COST=113898
L4      7599 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L5       264 S L4 AND ED>20210104
L6       264 S L5 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
         SAVE TEMP L6 GLYAGRI/A

   FILE 'BIOSIS' ENTERED AT 11:41:49 ON 14 MAY 2021
CHARGED TO COST=113898
L7     11785 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L8       277 S L7 AND ED>20210104
L9       258 S L8 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
         SAVE TEMP L9 GLYBIOS/A

   FILE 'CABA' ENTERED AT 11:43:47 ON 14 MAY 2021
CHARGED TO COST=113898
L10    19552 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L11      467 S L10 AND ED>20210104
L12      467 S L11 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
         SAVE TEMP L12 GLYCABA/A

   FILE 'FSTA' ENTERED AT 11:45:37 ON 14 MAY 2021
CHARGED TO COST=113898
L13      582 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L14       33 S L13 AND ED>20210104
L15       30 S L14 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
         SAVE TEMP L15 GLYFSTA/A

   FILE 'PQSCITECH' ENTERED AT 11:47:54 ON 14 MAY 2021
CHARGED TO COST=113898
L16     5625 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L17      104 S L16 AND ED>20210104
L18       74 S L17 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
         SAVE TEMP L18 GLYPQSCI/A

   FILE 'TOXCENTER' ENTERED AT 11:50:25 ON 14 MAY 2021
CHARGED TO COST=113898
L19    17721 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L20      573 S L19 AND ED>20210104
L21      383 S L20 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
         SAVE TEMP L21 GLYTOXC/A

   FILE 'EMBASE' ENTERED AT 11:52:13 ON 14 MAY 2021
CHARGED TO COST=113898
```

```
L22      6164 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L23       127 S L22 AND ED>20210104
L24       127 S L23 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
          SAVE TEMP L24 GLYEMBA/A

   FILE 'ESBIOBASE' ENTERED AT 11:54:26 ON 14 MAY 2021
CHARGED TO COST=113898
L25      5381 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L26       162 S L25 AND ED>20210104
L27       162 S L26 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
          SAVE TEMP L27 GLYESBIO/A

   FILE 'HCAPLUS' ENTERED AT 11:56:17 ON 14 MAY 2021
CHARGED TO COST=113898
L28     30693 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L29       729 S L28 AND ED>20210104
L30       343 S L29 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
          SAVE TEMP L30 GLYHCAP/A

   FILE 'SCISEARCH' ENTERED AT 11:58:14 ON 14 MAY 2021
CHARGED TO COST=113898
L31     12817 S GLY1/Q OR GLY2/Q OR GLY3/Q OR GLY4/Q OR GLY5/Q
L32       356 S L31 AND ED>20210104
L33       354 S L32 NOT (COMMENT? OR DISSERTATION OR EDITORIAL OR MEETING? OR
          SAVE TEMP L33 GLYSCIS/A

   FILE 'HOME' ENTERED AT 12:00:27 ON 14 MAY 2021
CHARGED TO COST=113898

   FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
   EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 12:03:58 ON 14 MAY 2021
CHARGED TO COST=113898
L34      1522 DUP REM L3 L6 L9 L12 L15 L18 L21 L24 L27 L30 L33 (1121 DUPLICAT
          SAVE L34 GLY202105/A
L35      1237 S L34 AND TOX/Q
          SAVE TEMP L35 GLYTOX/A
L36      1364 S L34 AND RES/Q
          SAVE TEMP L36 GLYRES/A
L37       932 S L34 AND FATE/Q
          SAVE TEMP L37 GLYFATE/A
L38      1436 S L34 AND ECO/Q
          SAVE TEMP L38 GLYECO/A
L39      1517 S L35 OR L36 OR L37 OR L38
          SAVE L39 GLY202105FIN/A
```

Literature Review Report

Scientific peer-reviewed open literature covering the publication period of 14 May 2021 to August 2021 for the approval of pesticide active substance glyphosate and metabolites

as under Article 8(5) of Regulation (EC) No 1107/2009

(Ref. EFSA Journal 2011; 9(2) 2092)

Report number

113898-CA9-4

Author

Anonymous, 2022

Sponsor

[redacted]

Reporting Date

28 April 2022

Date of search(es):

08 September 2021

Content

[redacted]

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Disclaimer

The information contained herein has been obtained from sources believed to be the most reliable. Every effort has been made to ensure completeness of data. However, no database search can be completely comprehensive, and it is possible that relevant documents have been omitted.

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1 Summary

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document (GD) - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

In addition, a recommendation by the Assessment Group on Glyphosate (AGG)[5] on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 72) for more details.

This Literature Review Report summarizes the search and evaluation of the glyphosate scientific peer-reviewed open literature covering the publication period of 14 May 2021 to August 2021 and is supplementary to the previous searches covering the publication period of January 2010 to 14 May 2021.[6]

The literature search was conducted accessing 11 bibliographic databases via the service provider STN.

In total, 543 articles were identified upon removal of duplicates within the current search (14 May 2021 to August 2021) and articles found already in the previous searches (January 2010 to 14 May 2021).

All 543 articles were subsequently assessed for their relevance at title/abstract level ("rapid assessment" according to the procedure and requirements stated in the EFSA 2092 GD).

A total of 470 of the 543 articles were identified as "non-relevant" in the rapid assessment (e.g. publications dealing with chemical synthesis, efficacy, analytical methods or publications which are not related to glyphosate or its metabolites) and excluded from further evaluation. Due to the large quantity of data, and as agreed with the AGG, the list of articles and the justification for their non-relevance is provided in a standalone Literature Review Excel File (Document ID: 113898_CA9-4_Literature Review Excel File).

For the remaining 73 articles, identified as potentially "relevant" or of "unclear relevance" in the rapid assessment, the full-text documents[7] were reviewed in detail ("detailed assessment").

[1] (aminomethyl)phosphonic acid (AMPA), N-acetyl-AMPA, N-acetyl-glyphosate, (hydroxymethyl)phosphonic acid (HMPA), N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA, methylphosphonic acid and N-methylglyphosate.

[2] European Food Safety Authority, 2011: *Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) No 1107/2009.* EFSA Journal 2011;9(2):2092. 49 pp, doi:10.2903/j.efsa.2011.2092.

[3] Appendix to EFSA Journal 2011;9(2):2092. *Further guidance on performing and presenting the literature search.* Available online: https://efsa.onlinelibrary.wiley.com/action/downloadSupplement?doi=10.2903/j.efsa.2011.2092&file=efs22092-sup-0001-Appendix.pdf

[4] European Food Safety Authority, 2019. *Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances.* EFSA supporting publication 2019:EN-1612. 49 pp., doi:10.2903/sp.efsa.2019.EN-1612.

[5] On 10th May 2019, the European Commission appointed four Member States (France, Hungary, the Netherlands and Sweden) to act jointly as 'rapporteurs' for the AIR5 process assessment of glyphosate. This group of Member States is known as the Assessment Group on Glyphosate (AGG).

[6] See Literature Review Reports 108689-CA9-1, 113898-CA9-1, 113898-CA9-2, and 113898-CA9-3 for more details.

[7] All articles used within the glyphosate dossier have been purchased via Copyright Clearance Centre. In some cases, please note that the Copyright Clearance is not overtly visible, and in some instances is part of the article documents. Should the Copyright Clearance proof be required, this can be provided upon request.

A total of 23 articles of the remaining 73 articles were identified as "non-relevant" in the detailed assessment and were excluded from further evaluation. The list of the articles and the justification for their non-relevance is provided in **Table 38** of this Literature Review Report document.

The remaining 50 articles of the 73 articles were identified as "relevant" in the detailed assessment and were classified according to the EFSA 2092 GD (EFSA Journal 2011;9(2):2092, Point 5.4.1).

Category A Articles which provide data for establishing or refining risk assessment parameters. For all articles of Category A, a reliability assessment was performed as recommended in the EFSA 2092 GD. In addition, summaries were compiled for Category A articles classified as "reliable" or "reliable with restrictions". The list of these Category A & reliable / reliable with restrictions articles can be found in **Table 32** and **Table 33** of this Literature Review Report document.

Category B Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment. A justification for such decision is provided as recommended in the EFSA 2092 GD. The list of these Category B articles and the justifications can be found in **Table 34** and **Table 35** of this Literature Review Report document.

Category C Articles for which relevance cannot be clearly determined. As recommended in the EFSA 2092 GD, an explanation is provided why the relevance could not be determined. The list of these Category C articles and the explanations can be found in **Table 36** and **Table 37** of this Literature Review Report document.

The full outcome of the literature evaluation is provided in **Table 1**.

Table 1: Summary of the literature review

Section	**Number of articles found**	**Rapid assessment (title/abstract level)**		**Detailed assessment (full-text level)**	
		non-relevant articles	**potentially relevant / unclear relevance**	**non-relevant articles**	**relevant articles (Category A+B+C)**
Efficacy / Agronomy [a)]	237	237	n.a.	n.a.	n.a.
Analytical methods [a)]	43	43	n.a.	n.a.	n.a.
Other non-relevant categories [b)]	38	38	n.a.	n.a.	n.a.
Ecotoxicology	82	50	32	15	17
E-fate	61	55	6	3	3
Residues	13	4	9	0	9
Toxicology	69	43	26	5	21
Total	**543**	**470**	**73**	**23**	**50**

[a)] Efficacy / Agronomy (e.g. reporting desired effects on organisms to be controlled) and development of analytical methods (artificial measurements) do not provide information useful/required for the environmental or human safety risk assessment.
[b)] The category "other non-relevant categories" covers a wide range of scientific publications which are not related to glyphosate or its metabolites or are not related to exposure of humans or the environment to glyphosate or its metabolites and thus not relevant for the risk assessments.

The full outcome of the relevant articles after detailed (full-text) assessment is provided in **Table 2**.

Table 2: Relevant articles by full-text classified according to the EFSA 2092 GD, Point 5.4.1

	Relevant articles by full-text (EFSA 2092 GD, Point 5.4.1)		
Section	**Category A [a)]**	**Category B [b)]**	**Category C [c)]**
Ecotoxicology	10	5	2
E-fate	0	3	0
Residues	0	9	0
Toxicology	0	15	6
Total	**10**	**32**	**8**

[a)] Category A: Articles, which provide data for establishing or refining risk assessment parameters.
[b)] Category B: Articles relevant to the data requirement but in the opinion of the applicant providing only supplementary information that does not alter existing risk assessment.
[c)] Category C: Articles for which relevance cannot be clearly determined.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

Please refer to **Appendix 2** (page 73) to see the article selection process in detail.

2 Introduction

A literature search for glyphosate and its metabolites[1] was conducted according to the requirements stated in the EFSA 2092 Guidance Document - EFSA Journal 2011;9(2):2092 "*Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009*[2]", and the Appendix to the EFSA 2092 Guidance Document "*Further guidance on performing and presenting the literature search*"[3], and the EFSA Supporting publication from 2019[4] "*Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances".*

In addition, a recommendation by the Assessment Group on Glyphosate (AGG) on how to present the literature search in the dossier has been followed. Please refer to **Appendix 1** (page 72) for more details.

In June 2020, a Literature Review Report (Document ID: 108689-CA9-1) summarizing results of the search of the glyphosate scientific peer-reviewed open literature published from January 2010 to December 2019 was submitted to the AGG as part of the glyphosate AIR5 dossier. In July 2020 during the dossier completeness check (point 23)[8], the AGG requested a top-up search for glyphosate open literature covering the publication period of January 2020 to June 2020. In October 2020, a Literature Review Report (Document ID: 113898-CA9-1) summarizing results of this top-up search was submitted to the AGG.

Furthermore, three additional supplementary literature searches of the glyphosate scientific peer-reviewed open literature were performed in January 2021, May 2021, and September 2021. The first search, from January 2021, covers the publication period of July 2020 to December 2020 and is summarized in the Literature Review Report Document ID: 113898-CA9-2. The second search, from May 2021, covers the publication period of January 2021 to 14 May 2021 and is summarized in this Literature Review Report (Document ID: 113898-CA9-3). The third search, from September 2021, covers the publication period of 14 May 2021 to August 2021 and is summarized in this Literature Review Report (Document ID: 113898-CA9-4). Details for this search are provided below.

The search has been conducted via the online service provider STN (www.stn-international.de) that provides access to a broad range of databases and to published research, journal literature, patents, structures, sequences, properties, and other data.

To offer a comprehensive literature search covering the requirements of the EFSA 2092 GD eleven databases have been used: AGRICOLA, BIOSIS, CABA, HCAPLUS, EMBASE, ESBIOBASE, MEDLINE, TOXCENTER, FSTA, PQSCITECH, and SCISEARCH.

Please refer to **Table 3** for more details on the literature search.

[8] AGG's letter dated 10-July-2020, subject "Glyphosate: Check of completeness of the supplementary dossier for renewal of approval under Commission Implementing Regulation (EU) No 844/2012", section 2: Elements to be submitted in accordance with Article 11(5) of Regulation (EU) No 844/2012, point 23.

Table 3: Overview of the search conducted for glyphosate and its metabolites

Performed for	Covering publication period	Conducted on
Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	14 May 2021 – August 2021	08 September 2021

AMPA = (aminomethyl)phosphonic acid
HMPA = (hydroxymethyl)phosphonic acid

A "focused search for grouped data requirements"[9] have been performed (a combination of a substance basic input parameters, keywords and "search filters" defined for the four technical sections – toxicology, residues, environmental fate, and ecotoxicology).

Please refer to **Chapter 2.2** and **2.3** (pages 14 and 16) for the input parameters, keywords and search filters used in the literature search.

Regarding details on the bibliographic databases used in the literature search, please refer to **Chapter 2.1** (**Table 4**).

Regarding the number of articles retrieved in the literature search, please refer to **Chapter 2.1** (**Table 5**).

For the relevance and reliability assessment, please refer to **Chapter 2.4** and **2.5** (pages 19 and 22).

For the full outcome of the literature search and for the individual technical sections, please refer to **Chapter 3** (page 27).

[9] Citation from the EFSA 2092 Guidance Document: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

2.1 Bibliographic databases used in the literature search

Table 4: Overview of the databases used in the literature search

Data requirement(s) captured in the search	Details of the search(es)			
	1. AGRICOLA	2. BIOSIS	3. CABA	4. HCAPLUS
Justification for choosing the source:	Provides literature from agriculture and related fields, e.g. biology, biotechnology, botany, ecology etc.	Provides the most comprehensive and largest life science literature, e.g. biosciences, biomedicine etc.	Provides literature from agriculture and related sciences, e.g. biotechnology, forestry, veterinary medicine etc.	Provides literature from chemistry and related fields, e.g. biochemistry, chemical engineering etc.
Number of records in the database at the time of search:	> 7.1 million (09/2020)	> 27.8 million (04/2019)	> 9.9 million (09/2020)	> 57.0 million (01/2022)
Database update:	Monthly	Weekly	Weekly	Daily updates bibliographic data; weekly updates indexing data
Date of the search:	08 September 2021	08 September 2021	08 September 2021	08 September 2021
Database covers records:	1970-present	1926-present	1973-present	1907-present and more than 180,000 pre-1907
Date of the latest database update:	04 August 2021	01 September 2021	01 September 2021	07 September 2021
Language limit:	No	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	287	239	353	272

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	**Details of the search(es)**		
	5. MEDLINE	**6. EMBASE**	**7. TOXCENTER**
Justification for choosing the source:	Provides literature from every area of medicine.	Provides literature from biomedicinal and pharmaceutical fields, e.g. bioscience, biochemistry, human medicine, forensic science, paediatrics, pharmacy, pharmacology, drug therapy, psychiatry, public health, biomedical engineering, environmental science.	Provides literature on pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals.
Number of records in the database at the time of search:	> 33.5 million (01/2022)	> 34.3 million (08/2018)	> 16.2 million (01/2022)
Database update:	Six times each week, with an annual reload	Daily	Weekly
Date of the search:	08 September 2021	08 September 2021	08 September 2021
Database covers records:	1946-present	1974-present	1907-present
Date of the latest database update:	07 September 2021	07 September 2021	06 September 2021
Language limit:	No	No	No
Document types <u>excluded</u> that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.		
Total number of records retrieved:	158	120	353

Table 4: Overview of the databases used in the literature search (continued)

Data requirement(s) captured in the search	**Details of the search(es)**			
	8. FSTA	**9. PQSCITECH**	**10. ESBIOBASE**	**11. SCISEARCH**
Justification for choosing the source:	Provides literature on scientific and technological aspects of the processing and manufacture of human food products, e.g. biotechnology, hygiene and toxicology, engineering etc.	Provides a valuable and huge resource of literature (merge of 25 STN databases) from all science areas and technology; from engineering to lifescience.	Provides comprehensive literature on entire spectrum of biological and biosciences research, e.g. microbiology, biotechnology, ecological & environmental sciences, genetics, plant and crop science, toxicology and many more.	Provides one of the largest multidisciplinary scientific literature covering a broad field of sciences, technology, and biomedicine.
Number of records in the database at the time of search:	> 1.59 million (09/2020)	> 33.6 million (01/2021)	> 9.0 million (01/2021)	> 47.7 million (08/2019)
Database update:	Weekly	Monthly	Weekly	Weekly
Date of the search:	08 September 2021	08 September 2021	08 September 2021	08 September 2021
Database covers records:	1969-present	1962-present	1994-present	1974-present
Date of the latest database update:	03 September 2021	24 August 2021	01 September 2021	06 September 2021
Language limit:	No	No	No	No
Document types excluded that are not "scientific peer-reviewed open literature":	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release	Comments, dissertations, editorials, meetings reports, news, patents, press release
Search strategy:	Details are summarized in **Chapter 2.2** and **2.3**.			
Total number of records retrieved:	19	111	129	387

Table 5: Total number of articles retrieved

Scope of the search	After automatic removal of duplicates within the databases in the current search (14 May 2021- Aug 2021)	After applying search filters [a] within the current search (14 May 2021- Aug 2021)	After manual removal of duplicates [b] within the current search (14 May 2021- Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021) [c]
14 May 2021 - Aug 2021 Glyphosate AMPA N-acetyl-AMPA N-acetyl-glyphosate HMPA N-methyl-AMPA N-glyceryl-AMPA N-malonyl-AMPA methylphosphonic acid N-methylglyphosate	**1443**	**1431**	**543**

[a] Search filters applied for the four technical sections (residues, environmental fate, toxicology and ecotoxicology). Please refer to **Chapter 2.3** for more details (page 16).

[b] Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[c] Please refer to the Literature Review Report (LRR) 108689-CA9-1, 113898-CA9-1, 113898-CA9-2, and 113898-CA9-3.

Note: LRR 108689-CA9-1 covers the publication period of 1 January 2010 to 31 December 2019, LRR 113898-CA9-1 covers the publication period of 1 January 2020 to 30 June 2020, LRR 113898-CA9-2 covers the publication period of 1 July 2020 to 31 December 2020, 113898-CA9-3 covers the publication period of 1 January 2021 to 14 May 2021.

2.2 Input parameters used in the literature search

The basic input parameters used in the literature search, e.g. IUPAC, chemical name or CAS number, are provided in **Table 6 - Table 15**.

Table 6: Input parameters – active substance Glyphosate

Substance name	Glyphosate Salts: isopropylamine, potassium, ammonium, methylmethanamine
IUPAC / CA name	2-(phosphonomethylamino)acetic acid
CAS number(s)	1071-83-6 Salts: 38641-94-0, 70901-12-1, 39600-42-5, 69200-57-3, 34494-04-7, 114370-14-8, 40465-66-5, 69254-40-6

Table 7: Input parameters – metabolite AMPA

Substance name	AMPA
IUPAC / CA name	(aminomethyl)phosphonic acid
CAS number(s)	1066-51-9

Table 8: Input parameters – metabolite N-acetyl glyphosate

Substance name	N-acetyl glyphosate
IUPAC / CA name	N-acetyl-N-(phosphonomethyl)glycine
CAS number(s)	129660-96-4

Table 9: Input parameters – metabolite N-acetyl AMPA

Substance name	N-acetyl AMPA
IUPAC / CA name	[(acetylamino)methyl]phosphonic acid
CAS number(s)	57637-97-5

Table 10: Input parameters – metabolite HMPA

Substance name	HMPA
IUPAC / CA name	(hydroxymethyl)phosphonic acid
CAS number(s)	2617-47-2

Table 11: Input parameters – metabolite N-methyl AMPA

Substance name	N-methyl AMPA
IUPAC / CA name	[(methylamino)methyl]phosphonic acid
CAS number(s)	35404-71-8

Table 12: Input parameters – metabolite N-glyceryl AMPA

Substance name	N-glyceryl AMPA
IUPAC / CA name	(2,3-dihydroxypropanoylamino)methylphosphonic acid
CAS number(s)	No data

Table 13: Input parameters – metabolite N-malonyl AMPA

Substance name	N-malonyl AMPA
IUPAC / CA name	3-oxo-3-(phosphonomethylamino)propanoic acid
CAS number(s)	no data

Table 14: Input parameters – metabolite methylphosphonic acid

Substance name	methylphosphonic acid
IUPAC / CA name	methylphosphonic acid
CAS number(s)	993-13-5

Table 15: Input parameters – metabolite N-methylglyphosate

Substance name	N-methylglyphosate
IUPAC / CA name	2-[methyl(phosphonomethyl)amino]acetic acid
CAS number(s)	24569-83-3

2.3 Keywords and search filters used in the literature search

The approach used for the search was the "focused search for grouped data requirements"[10], which combines the active substance and metabolite basic input parameters, keywords and search filters defined for each technical section. Please refer to **Table 16** for more details on the keywords used and to **Table 17** - **Table 20** for the search filters.

Table 16: Keywords used for the active substance glyphosate and its metabolites

Gly1: Glyphosate and AMPA	glyphosat? OR glifosat? OR glyfosat? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR 69254-40-6 OR aminomethyl phosphonic OR aminomethylphosphonic OR 1066-51-9
Gly2: N-acetyl glyphosate and N-acetyl AMPA	2 acetyl phosphonomethyl amino acetic acid OR n acetyl glyphosate OR n acetylglyphosate OR n acetyl n phosphonomethyl glycine OR 129660-96-4 OR n acetyl ampa OR acetylamino methyl phosphonic acid OR acetylaminomethyl phosphonic acid OR 57637-97-5
Gly 3: HMPA	2617-47-2 OR hydroxymethanephosphonic acid OR hydroxymethyl phosphonate OR hydroxymethylphosphonate OR hydroxymethyl phosphonic acid OR hydroxymethylphosphonic acid OR methanehydroxyphosphonic acid OR phosphonic acid(1w)hydroxymethyl OR phosphonomethanol
Gly 4: N-methyl AMPA	35404-71-8 OR methylamino methyl phosphonic acid OR methylaminomethyl phosphonic acid OR methylaminomethylphosphonic acid OR n methyl ampa OR nsc 244826 OR phosphonic acid methylamino methyl OR phosphonic acid p methylamino methyl
Gly 4: N-glyceryl AMPA	2 3 dihydroxy 1 oxopropyl aminomethyl phosphonic acid OR 2 3 dihydroxy 1 oxopropyl aminomethylphosphonic acid OR n glyceryl ampa
Gly 4: N-malonyl AMPA	3 oxo 3 phosphonomethyl amino propanoic acid OR 3 oxo 3 phosphonomethyl aminopropanoic acid OR n malonyl ampa
Gly 4: methylphosphonic acid	993-13-5 OR dihydrogen methylphosphonate OR methanephosphonic acid OR methyl phosphonic acid OR methylphosphonic acid OR nsc 119358 OR phosphonic acid methyl OR phosphonic acid p methyl
Gly 5: N-methylglyphosate (NMG)	24569-83-3 OR 2 methyl phosphonomethyl amino acetic acid OR 2 methyl phosphonomethyl aminoacetic acid OR acetic acid 2 n methyl n phosphonatomethyl amino OR glycine n methyl n phosphonomethyl OR glyphosate n methyl OR methyl glyphosate OR methyl phosphonomethyl amino acetic acid OR methyl phosphonomethyl aminoacetic acid OR n methyl n phosphonomethyl glycine OR n methylglyphosate OR n phosphonomethyl n methyl glycine OR n phosphonomethyl n methylglycine

(1w) = proximity operator (this order, up to 1 word between)
AND / OR / NOT = boolean search operators
? = any character(s)

[10] Citation from the EFSA 2092 GD: *If the number of summary records returned by a single concept search* is extremely large, focused searches for individual or grouped data requirements could be developed. Such searches could combine synonyms for the active substance (one concept) with terms and synonyms for characteristics of the data requirement (second concept).*

**NOTE:* Single concept search (as defined in the EFSA 2092 GD document) = using the active substance names and its synonyms.

Table 17: Search filters related to the technical section toxicology

Toxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR hazard? OR adverse OR health OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR in vivo OR in vitro OR invivo OR invitro OR mode of action OR skin? OR eye? OR irrit? OR sensi? OR allerg? OR rat OR rats OR dog? OR rabbit? OR guinea pig? OR mouse OR mice OR metabolism OR metabolite? OR metabolic OR distribution OR adsorption OR excretion OR elimination OR kinetic OR cytochrome OR enzym? OR gen? OR muta? OR chromos? OR clastogen? OR DNA OR carcino? OR cancer? OR tumor? OR tumour? OR oncog? OR oncol? OR malign? OR immun? OR neur? OR endocrin? OR hormon? OR gonad? OR disrupt? OR reproduct? OR development? OR malform? OR anomal? OR fertil? OR foet? OR fet? OR matern? OR pregnan? OR embryo? OR epidem? OR medical? OR poison? OR exposure OR operator? OR bystander? OR resident? OR worker? OR occupat? biomonitoring OR human exposure OR microbiome OR oxidative stress OR apoptosis OR necrosis OR cytotoxicity OR Polyoxyethyleneamine OR POEA OR surfactant OR risk assessment?

Table 18: Search filters related to the technical section residues

Residues [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
uptake OR translocation OR rumen OR storage stability OR storage OR stability OR metabolic OR metabolism OR breakdown OR nature of residues OR residue? OR magnitude of residues OR process? OR effects of processing OR dessicant OR preharvest OR preemerg? OR ?resistant? OR ?toleran? OR transgenic OR hydroly? OR rotation? OR succeed? OR plant? OR crop? OR feed? OR animal? OR livestock? OR hen OR cattle OR ruminant? OR goat? OR cow? OR pig? OR dietary OR assessment OR risk assessment OR consum? OR exposure

Table 19: Search filters related to the technical section environmental fate

Environmental fate [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
soil OR water OR sediment OR degradat? OR photo? OR soil residues OR soil accumulat? OR soil contaminat? OR mobility OR sorption OR column leaching OR aged residue OR leach? OR lysimeter OR groundwater OR contaminat? OR microb? OR exudation OR rhizosphere OR dissipation OR saturated zone OR hydrolysis OR drift OR run-off OR runoff OR drainage OR volat? OR atmosphere OR long-range transport OR short-range transport OR transport OR micronutrient OR phosphate OR iron OR manganese OR half-life OR halflife OR half-lives OR halflives OR DT50 OR kinetics OR off-site movement OR removal OR drinking water OR water treatment processes OR atmospheric deposition OR tile-drains OR surface water OR monitoring data OR disinfectant OR ozone OR tillage OR infiltration OR hard surface OR rainwater OR rain water OR chelat? OR complex? OR mineralization OR persistence OR ligand

Table 20: Search filters related to the technical section ecotoxicology

Ecotoxicology [Gly1] OR [Gly2] OR [Gly3] OR [Gly4] OR [Gly5] AND the following search filters
tox? OR ecotox? OR ?toxic OR ?toxicity OR hazard OR adverse OR endocrine disrupt? OR bioaccumulate? OR biomagnifi? OR bioconcentration OR poison OR effect OR indirect effect? OR direct effect? OR biodivers? OR protection goals OR eco? OR impact OR population OR OR community OR wildlife OR incident OR wildlife OR incident OR pest OR bird? OR acute OR chronic OR long-term OR mallard OR duck OR quail OR bobwhite OR Anas? OR Colinus? OR wild OR dietary OR aquatic OR fish OR daphni? OR alg? OR chiron? OR sediment dwell? OR benthic OR lemna OR marin? OR estuarine OR crusta? OR gastropod? OR insect OR mollusc OR reptile OR amphib? OR plant AND submerge? OR emerge? OR bee? OR apis OR apidae OR bumble? OR colony OR hive OR pollinator OR solitary OR alg? OR aquatic OR freshwater OR vertebrat? OR mammal? OR rat OR mouse OR mice OR rabbit OR hare OR protection OR model? OR vole OR pest OR arthropod? OR beneficials OR typhlodromus OR aphidius OR parasitoid OR predator OR chrysoperla OR Orius OR spider OR worm? OR ?worm OR Eisenia OR soil OR collembol? OR macro organism OR folsomia OR springtail OR decompos? OR micro organisms OR microorganisms OR microbial OR carbon OR nitrogen OR plant? OR vegetative vigo? OR seedling OR germination OR monocot? OR dicot? OR sewage OR activated sludge OR biodegrad? OR bioaccumulation? OR amphib? OR reptile? OR aquatic plant OR beneficial

2.4 Relevance assessment

After removal of duplicates, the remaining articles were assessed for their relevance. First, at "title / abstract level" (so-called "rapid assessment") and second, at "full-text level" (so called "detailed assessment").
Articles that were identified as "non-relevant" in the rapid assessment were excluded from further evaluation and a justification for their non-relevance was provided.
For articles that were not excluded in the rapid assessment (potentially relevant articles and articles of an unclear relevance) a detailed relevance assessment of a full-text document was performed.
Articles that were identified as "non-relevant" in the detailed assessment were excluded from further evaluation and a justification for their non-relevance was provided.

For both assessments (rapid and detailed) the same criteria for non-relevance were applied (see **Chapter 2.4.1** and **2.4.2**).

2.4.1 Criteria applied for "non-relevance"

Articles identified as "non-relevant" in the rapid and detailed assessments belong to one of the following categories and were excluded from further evaluation. A justification for their non-relevance was provided.

- Publications related to efficacy (resistance related articles, new uses of control of pest / crops) or to agricultural / biological research (crop science, breeding, fertilization, tillage, fundamental plant physiology / micro- / molecular biology).
- Publications dealing with analytical methods / development.
- Publications describing new methods of synthesis (discovery / developments) or other aspects of basic (organic / inorganic) chemistry.
- Patents.
- Wastewater treatment.
- Abstracts referring to a conference contribution that does not contain sufficient data / information for regulatory risk assessment.
- Publications focusing on genetically modified organisms / transgenic crops; no data directly relevant to glyphosate evaluation (e.g. crop compositional analysis, gene flow, protein characterization).
- Publications where glyphosate or a relevant metabolite were not the focus of the publication.
- Secondary information including scientific and regulatory reviews[11].
- Articles dealing with political / socio / economic analysis.
- Observations caused by mixture of compounds / potentially causal factors and thus not attributable to a substance of concern (e.g. mixture toxicity).
- Study design, test system, species tested, exposure routes etc. that are not relevant for the European regulatory purposes.
- Findings not related to ecotoxicology, toxicology, residues, and environmental fate.
- Publications not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.).

[11] Reviews have been partly evaluated on full text level as well – case by case decision.

- Publications dealing with a Roundup[12] formulation / other glyphosate formulations that is not the representative formulation for the AIR5 dossier and thus not relevant to the EU glyphosate renewal.
- Publications dealing with general pesticide exposures (not glyphosate specific).
- Publications generating endpoints that are not relatable to the EU level regulatory risk assessment (e.g. findings based on enzyme, cellular and molecular level etc.).
- Opinion articles where no new data is provided that can be used for the EU regulatory risk assessment.

2.4.2 Additional criteria for articles on the health and exposure of glyphosate

The scientific literature on the health effects of glyphosate can be subdivided in two main parts:

- Articles containing data on glyphosate acid and salts and on the reference glyphosate formulation MON 52276, and
- Articles only containing data on glyphosate formulations and/or co-formulants that have a composition different from that of the reference formulation MON 52276.

In the case of articles only relating to glyphosate formulations *in vitro* testing with the exception of cell/tissue systems[13] that are likely to come in direct contact with formulations and glyphosate formulations containing other active ingredients are excluded. The reason for the exclusion of *in vitro* testing of formulations to assess health effects as a result of systemic exposure is the presence of surfactants which produce cell toxicity based on the destabilization of the cell membrane and the mitochondrial membrane thus masking the specific toxicity of glyphosate. The toxicity of the co-formulants in combination with glyphosate is dependent on the concentration and the nature of the co-formulants and can be addressed on a case-by-case basis during the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

In the relevance of glyphosate data, those articles have been considered as not relevant (and reliable) for the assessment for systemic toxicity when only *in vitro* results are presented with glyphosate concentrations above 1 mM. This is because it is physiologically not possible to attain such concentrations in standard regulatory *in vivo* testing due to the limited oral bioavailability (approx. 20%), very low dermal absorption, and rapid systemic elimination of glyphosate in *in vivo* test systems. It thus makes no sense to include such data in the risk assessment of glyphosate. Exceptions can be made in the event of direct contact with formulations resulting in localized effects, but then there is the contribution of the toxicity of the co-formulants which can be better addressed in the evaluation of formulations on an ad-hoc basis through Zonal and Member State formulation registrations.

[12] Roundup is a brand that contains multiple glyphosate-based herbicides, that contain different co-formulants. Of most importance to the toxicity profile associated with a particular product is whether that product contains a surfactant polyethoxylated tallow amine (also polyoxyethyleneamine, POEA) which is not permitted for use in the EU. As the performance / efficacy of herbicidal formulations is dependant on the surfactant system / co-formulants, the findings in articles dealing with POEA based Roundup formulations cannot be related to the representative formulation MON 52276 which is quaternary-ammonium based (and not POEA based).

[13] Glyphosate-based herbicides (GBH) contain surfactants that destabilize the cell membrane and the mitochondrial membrane and thus produce a toxicity that is not representative for glyphosate (see Levine S. L. et al, *Cell Biol. Toxicol. (2007) 23:385-400*). This has been clearly demonstrated in the scientific literature and also in some papers reviewed for this submission where *in vitro* glyphosate toxicity is compared against that of GBH and surfactants.

The limit of 1 mM has been based on the single dose oral pharmacokinetic data of a formulation containing 71.7% w/w glyphosate where an oral dose of 1,430 mg/kg bw in the rat gives plasma levels of 38.1 µg/mL or 0.225 mM after 2 hours. When extrapolated linearly (which is possible for glyphosate because it is not subject to hepatic metabolism) this gives plasma levels of 53.3 µg/mL or 0.315 mM at 2 hours after oral intake of 2,000 mg/kg bw and 107 µg/mL or 0.630 mM at 2 hours after oral intake of 4,000 mg/kg bw. A systemic concentration of glyphosate of 1 mM would then represent an oral dose of more than 6,000 mg/kg bw which is completely unreasonable for repeat dose experimental *in vivo* testing under today's OECD test guidelines. The ADI for glyphosate of 0.5 mg/kg bw/day corresponds with a daily systemic concentration of 0.17 µg/mL or 1 µM when a 60 kg person with 36 L extracellular fluid is considered with a glyphosate oral bioavailability of 20%. The daily systemic dose of glyphosate on the day of application (i.e. highest exposure day), based on the geometric mean of 3.2 µg/L in urine, of glyphosate applicators in the US is approx. 0.0001 mg/kg bw/day (Acquavella, 2004[14]) which is 1000 times less than the systemic dose (0.1 mg/kg bw) corresponding with the ADI oral dose of 0.5 mg/kg bw with 20% oral bioavailability.

Many articles that have been considered relevant for the risk assessment of glyphosate and have been assessed for reliability on full text basis, contain experimental data as well on glyphosate as such as on formulations (different from MON 52276) and co-formulants. In such cases, only the toxicology data pertinent to glyphosate and to the reference formulation (if that can be clearly stated by the author of the article) are summarized and discussed. In the case of articles on exposure monitoring and epidemiology, exposure to glyphosate formulations are considered.

2.4.3 Categorization of "relevant" articles at full-text level

Articles that were not excluded in the detailed assessment (see **Chapter 2.4.1** and **2.4.2**) were categorized as recommended in the EFSA 2092 GD - EFSA Journal 2011;9(2):2092, Point 5.4.1.

Category A *Studies that provide data for establishing or refining risk assessment parameters. These studies should be summarised in detail following the subsequent steps of the OECD Guidance documents (OECD, 2005; 2006) and should be considered for reliability.*

Category B Studies that are relevant to the data requirement, but in the opinion of the applicant provide only supplementary information that does not alter existing risk assessment parameters. A justification for such a decision should be provided.

Category C Studies for which relevance cannot be clearly determined. For each of these studies the applicants should provide an explanation of why the relevance of such studies could not be definitively determined.

The list of Category A articles can be found in **Table 32** and **Table 33**. The list of Category B articles and the justifications can be found in **Table 34** and **Table 35**. The list of Category C articles and the explanations can be found in **Table 36** and **Table 37**.

All articles (and their translations) evaluated at full text level (detailed assessment) were submitted to the AGG in a Portable Document Format (PDF).

[14] Acquavella J. F. *et al.* (2004), Environmental Health Perspectives, 112(3), 321-326.

2.5 Reliability assessment

For articles, which were identified, in the detailed assessment, as relevant articles of Category A (see **Chapter 2.4.3**) a reliability assessment was performed. The reliability criteria for each technical section are summarized in **Table 21 - Table 23**.

For relevant articles of Category A that were classified either as reliable (without restrictions) or reliable with restrictions, summaries were compiled.
Articles of Category A which were classified as non-reliable were downgraded to articles of Category B and justification for such a decision was provided.

Table 21: Reliability criteria for ecotoxicology, environmental fate and residues

Applied for	**Reliability criteria**
Ecotoxicology, Environmental Fate, Residues	For guideline-compliant studies (GLP studies): OECD, OPPTS, ISO, and others. The validity/quality criteria listed in the corresponding guidelines are met.
Ecotoxicology, Environmental Fate, Residues	(No) previous exposure to other chemicals is documented (where relevant).
Ecotoxicology	For aquatic studies, the test substance is dissolved in water or where a carrier is required, it is appropriate (non-toxic) and a carrier control / positive control is considered in the test design.
Environmental Fate, Residues	The test substance is dissolved in water or non-toxic solvent.
Ecotoxicology, Environmental Fate, Residues	Test item is sufficiently documented, and reported (i.e. purity, source, content, storage conditions).
Ecotoxicology	For tests including vertebrates, compliance of the batches used in toxicity studies compared to the technical specification.
Ecotoxicology	Species used in the experiment are clearly reported, including source, experimental conditions (where relevant): strain, adequate age/life stage, body weight, acclimatization, temperature, pH, oxygen (dissolved oxygen for aquatic tests) content, housing, light conditions, humidity (terrestrial species) incubation conditions, feeding.
Ecotoxicology	The validity criteria from relevant test guidelines can be extrapolated across different species but not necessarily across different test designs. If different, then the nature of the difference and impact should ideally be discussed.
Ecotoxicology, Environmental Fate, Residues	Only glyphosate or its metabolites is the test substance (excluding mixture), and information on application of the test substance is described.
Ecotoxicology, Environmental Fate, Residues	The endpoint measured can be considered a consequence of glyphosate (or a glyphosate metabolite).
Ecotoxicology, Environmental Fate, Residues	Study design / test system is well described, including when relevant: concentration in exposure media (dose rates, volume applied, etc.), dilution/mixture of test item (solvent, vehicle) where relevant.
Ecotoxicology, Environmental Fate, Residues	Analytical verifications performed in test media (concentration) / collected samples, stability of the test substance in test medium should be documented.

Applied for	Reliability criteria
Ecotoxicology	The test has been performed in several dose levels (at least 3) including a positive / negative control where relevant.
Ecotoxicology	Suitable exposure throughout the whole exposure period was demonstrated and reported.
Ecotoxicology	A clear concentration response relationship is reported – in studies where the dose response test design is employed.
Ecotoxicology	A sufficient number of animals per group to facilitate statistical analysis reported: mortality in control groups reported, observations/findings in positive/negative control clearly reported (where relevant).
Ecotoxicology, Environmental Fate, Residues	Assessment of the statistical power of the assay is possible with reported data.
Ecotoxicology, Environmental Fate, Residues	Statistical methodology is reported (e.g., checking the plots and confidence intervals).
Ecotoxicology	Description of the observations (including time-points), examinations, and analyses performed, with (where relevant) dissections being well documented.
Ecotoxicology	For terrestrial ecotoxicological studies in the laboratory or the field, the substrates used should be adequately described e.g. nature of substrate i.e. species of leaf or soil type.
Ecotoxicology, Environmental Fate, Residues	Field locations relevant / comparable to European conditions.
Ecotoxicology, Environmental Fate, Residues	Characterization of soil: texture (sandy loam, silty loam, loam, loamy sand), pH (5.5-8.0), cation exchange capacity, organic carbon (0.5-2-5%), bulk density, water retention, microbial biomass (~1% of organic carbon).
Ecotoxicology, Environmental Fate	Other soils where information on characterization by the parameters: pH, texture, CEC, organic carbon, bulk density, water holding capacity, microbial biomass.
Ecotoxicology, Environmental Fate, Residues	For tests including agricultural soils, they should not have been treated with test substance or similar substances for a minimum of 1 year.
Ecotoxicology, Environmental Fate	For soil samples, sampling from A-horizon, top 20 cm layers; soils freshly from field preferred (storage max 3 months at 4 +/- 2°C).
Ecotoxicology, Environmental Fate, Residues	Data on precipitation is recorded.
Environmental Fate	The temperature was in the range between 20-25°C and the moisture was reported.
Environmental Fate	The presence of glyphosate identified in samples were collected from European groundwater, soil, surface waters, sediments or air.
Ecotoxicology	For lab terrestrial studies, the temperature was appropriate to the species being tested and generally should fall within the range between 20-25°C and soil moisture / relative humidity was reported.
Ecotoxicology	For bee studies, temperature of the study should be appropriate to species.
Ecotoxicology	For lab aquatic studies:
	The source and / or composition of the media used should be described.
	The temperature of the water should be appropriate to the species being tested and generally fall within the 15-25ºC.

Applied for	Reliability criteria
Ecotoxicology, Residues	The residue data can be linked to a clearly described GAP table, appropriate in the context of the renewal of approval of glyphosate (crop, application method, doses, intervals, PHI).
Ecotoxicology, Environmental Fate, Residues	Analytical results present residues measurements which can be correlated with the existing residues definition of glyphosate, and where relevant its metabolites.
Ecotoxicology, Environmental Fate, Residues	Analytical methods are clearly described; and adequate statement of specificity and sensitivity of the analytical methods is included.
Ecotoxicology	Assessment of the ECX for the width of the confidence interval around the median value; and the certainty on the level of protection offered by the median ECX is reported.
Environmental Fate	Radiolabel characterization: purity, specific activity, location of label is reported.
Environmental Fate	If degradation kinetics are included: data tables / model description / statistical parameters for kinetic fit to be provided.
Environmental Fate, Residues	Monitoring data: description of matrix analysed, and analytical methods to be fully described.
Environmental Fate	Clear description of application rate and relevance to approved uses.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 22: Reliability criteria for toxicology – epidemiology and exposure studies

Reliability criteria – toxicology	
Epidemiology studies	**Exposure studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines/practices.	Study in accordance to valid internationally accepted testing guidelines/practices.
Study completely described and conducted following scientifically acceptable standards.	Study performed according to GLP.
	Study completely described and conducted following scientifically acceptable standards.
Test substance	**Test substance**
Exposure to formulations with only glyphosate as a.i.	Exposure to formulations with only glyphosate as a.i.
Exposure to formulations with glyphosate combined with other a.i.	Exposure to formulations with glyphosate combined with other a.i.
Exposure to various formulations of pesticides.	Exposure to various formulations of pesticides.
Study	**Study**
Study design – epidemiological method followed.	Study design clearly described.
Description of population investigated.	Population investigated sufficiently described.
Description of exposure circumstances.	Exposure circumstances sufficiently described.
Description of results.	Sampling scheme sufficiently documented.
Have confounding factors been considered.	Analytical method described in detail.
Statistical analysis.	Validation of analytical method reported.
	Monitoring results reported.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

Table 23: Reliability criteria for toxicology – *in vitro* and *in vivo* studies

Reliability criteria – toxicology and metabolism	
***In vitro* studies**	***In vivo* studies**
Guideline-specific	**Guideline-specific**
Study in accordance to valid internationally accepted testing guidelines.	Study in accordance to valid internationally accepted testing guidelines.
Study performed according to GLP.	Study performed according to GLP.
Study completely described and conducted following scientifically acceptable standards.	Study completely described and conducted following scientifically acceptable standards.
Test substance	**Test substance**
Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions).	Test material (Glyphosate) is sufficiently documented and reported (i.e. purity, source, content, storage conditions).
Only glyphosate acid or one of its salts is the tested substance .	Only glyphosate acid or one of its salts is the tested substance.
AMPA or other glyphosate metabolite is the tested substance.	AMPA or other glyphosate metabolite is the tested substance.
Study	**Study**
Test system clearly and completely described.	Test species clearly and completely described.
Test conditions clearly and completely described.	Test conditions clearly and completely described.
Metabolic activation system clearly and completely described.	Route and mode of administration described.
Test concentrations in physiologically acceptable range (< 1 mM).	Dose levels reported.
Cytotoxicity tests reported.	Number of animals used per dose level reported.
Positive and negative controls.	Method of analysis described for analysis test media.
Complete reporting of effects observed.	Validation of the analytical method.
Statistical methods described.	Analytical verifications of test media.
Historical negative and positive control data reported.	Complete reporting of effects observed.
Dose-effect relationship reported.	Statistical methods described.
	Historical control data of the laboratory reported.
	Dose-effect relationship reported.
Overall assessment: Reliable / Reliable with restrictions / Not reliable	

3 Search results

The full outcome of the literature search and evaluation is provided below.

Table 24: Summary of the literature search – all technical sections

	Number	Justification
Total number of articles retrieved from the search.	2428	n.a.
Total number of articles after removal of duplicates within all databases.	1443	n.a.
Total number of articles after manual removal of duplicates. [a)]	543	n.a.
Number of articles excluded after rapid assessment (title / abstract).	470	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	73	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	23	See Table 38
Number of articles not excluded after detailed assessment. [b)]	50	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	10	See Table 32, Table 33

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 25: Results of the article selection process for ecotoxicology

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	82	n.a.
Number of articles excluded after rapid assessment (title / abstract).	50	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	32	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	15	See Table 38
Number of articles not excluded after detailed assessment. [b)]	17	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	10	See Table 32, Table 33

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 26: Results of the article selection process for environmental fate

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	61	n.a.
Number of articles excluded after rapid assessment (title / abstract).	55	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	6	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	3	See Table 38
Number of articles not excluded after detailed assessment. [b)]	3	See Table 32-Table 37
Number of summaries presented in the dossier. [c)]	0	See Table 32, Table 33

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 27: Results of the article selection process for residues

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	13	n.a.
Number of articles excluded after rapid assessment (title / abstract).	4	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	9	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	0	See Table 38
Number of articles not excluded after detailed assessment [b)]	9	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	0	See Table 32, Table 33

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 28: Results of the article selection process for toxicology

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	69	n.a.
Number of articles excluded after rapid assessment (title / abstract).	43	See the Literature Review Excel File.
Total number of full-text documents assessed in detail	26	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	5	See Table 38
Number of articles not excluded after detailed assessment [b)]	21	See Table 32-Table 37
Number of summaries presented in the dossier [c)]	0	See Table 32, Table 33

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 29: Results of the article selection process for analytical methods

	Number	Justification
Total number of articles after manual removal of duplicates [a)]	43	n.a.
Number of articles excluded after rapid assessment (title / abstract).	43	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment [b)]	n.a.	n.a.
Number of summaries presented in the dossier [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 30: Results of the article selection process for efficacy / agronomy

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	237	n.a.
Number of articles excluded after rapid assessment (title / abstract).	237	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b)]	n.a.	n.a.
Number of summaries presented in the dossier. [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 31: Results of the article selection process for "other non-relevant categories"

	Number	Justification
Total number of articles after manual removal of duplicates. [a)]	38	n.a.
Number of articles excluded after rapid assessment (title / abstract).	38	See the Literature Review Excel File.
Total number of full-text documents assessed in detail.	n.a.	n.a.
Number of articles excluded after detailed assessment (*i.e.* not relevant).	n.a.	n.a.
Number of articles not excluded after detailed assessment. [b)]	n.a.	n.a.
Number of summaries presented in the dossier. [c)]	n.a.	n.a.

[a)] After removal of duplicates within the current search (14 May 2021 – Aug 2021) and entries found already in the previous searches (Jan 2010 – 14 May 2021). Additional duplicates occurred due to different update frequencies within each database and entries of publications ahead of print.

[b)] All relevant articles by full-text belonging to the relevance Category A, B, C (acc. to the EFSA Journal 2011;9(2):2092, Point 5.4.1). For details, please refer to Chapter 2.4.3.

[c)] Summaries were compiled for relevant articles of Category A and classified either as reliable or reliable with restrictions.

Table 32: Relevant (category A) articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
1	CA 8.1.5	Diaz-Martín R. D. et al.	2021	Short exposure to glyphosate induces locomotor, craniofacial, and bone disorders in zebrafish (Danio rerio) embryos.	Environmental toxicology and pharmacology, (2021), Vol. 87, Article No. 103700	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
2	CA 8.2.2, CP 10.2.2	Le Du-Carree J. et al.	2021	Developmental effect of parental or direct chronic exposure to environmental concentration of glyphosate on the larvae of rainbow trout, Oncorhynchus mykiss.	Aquatic toxicology, (2021), Vol. 237, Article No. 105894	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
3	CA 8.2.2, CP 10.2.2	Le Du-Carree J. et al.	2021	Generational effects of a chronic exposure to a low environmentally relevant concentration of glyphosate on rainbow trout, Oncorhynchus mykiss.	The Science of the total environment, (2021), Vol. 801, Article No. 149462	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
4	CA 8.2.6.1	Kaeoboon S. et al.	2021	Toxicity response of Chlorella microalgae to glyphosate herbicide exposure based on biomass, pigment contents and photosynthetic efficiency.	Plant Science Today, (2021), Vol. 8, No. 2, pp. 293-300	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
5	CA 8.2.7	Mendes E. J. et al.	2021	Isolated and combined effects of glyphosate and its by-product aminomethylphosphonic acid on the physiology and water remediation capacity of Salvinia molesta.	Journal of hazardous materials, (2021), Vol. 417, Article No. 125694.	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
6	CA 8.2.8	Vera M. S. et al.	2021	First evaluation of the periphyton recovery after glyphosate exposure.	Environmental pollution, (2021), Vol. 290, Article No. 117998	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
7	CP 10.1.3	Goodman R. M. et al.	2021	Influence of Herbicide Exposure and Ranavirus Infection on Growth and Survival of Juvenile Red-Eared Slider Turtles (Trachemys scripta elegans).	Viruses, (2021), Vol. 13, No. 8	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
8	CP 10.2.1	Fernandez C. et al.	2021	Toxic effects of chlorpyrifos, cypermethrin and glyphosate on the non-target organism Selenastrum capricornutum (Chlorophyta).	Anais da Academia Brasileira de Ciencias, (2021) Vol. 93, Article No. e20200233	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
9	CP 10.2.1, CP 10.2.2	Houssou A. M. et al.	2021	Acute and Chronic Effects of a Glyphosate and a Cypermethrin-Based Pesticide on a Non-Target Species Eucypris sp. Vavra, 1891 (Crustacea, Ostracoda)	Processes, (2021), Vol. 9, No. 4	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
10	CP 10.4.2.1	Wee J. et al.	2021	Temperature and Aging Affect Glyphosate Toxicity and Fatty Acid Composition in Allonychiurus kimi (Lee) (Collembola).	Toxics, (2021), Vol. 9, No. 6	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.

Table 33: Relevant (category A) articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
1	Diaz-Martín R. D. et al.	CA 8.1.5	2021	Short exposure to glyphosate induces locomotor, craniofacial, and bone disorders in zebrafish (Danio rerio) embryos.	Environmental toxicology and pharmacology, (2021), Vol. 87, Article No. 103700	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
8	Fernandez C. et al.	CP 10.2.1	2021	Toxic effects of chlorpyrifos, cypermethrin and glyphosate on the non-target organism Selenastrum capricornutum (Chlorophyta).	Anais da Academia Brasileira de Ciencias, (2021) Vol. 93, Article No. e20200233	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
7	Goodman R. M. et al.	CP 10.1.3	2021	Influence of Herbicide Exposure and Ranavirus Infection on Growth and Survival of Juvenile Red-Eared Slider Turtles (Trachemys scripta elegans).	Viruses, (2021), Vol. 13, No. 8	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
9	Houssou A. M. et al.	CP 10.2.1, CP 10.2.2	2021	Acute and Chronic Effects of a Glyphosate and a Cypermethrin-Based Pesticide on a Non-Target Species Eucypris sp. Vavra, 1891 (Crustacea, Ostracoda)	Processes, (2021), Vol. 9, No. 4	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
4	Kaeoboon S. et al.	CA 8.2.6.1	2021	Toxicity response of Chlorella microalgae to glyphosate herbicide exposure based on biomass, pigment contents and photosynthetic efficiency.	Plant Science Today, (2021), Vol. 8, No. 2, pp. 293-300	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
2	Le Du-Carree J. et al.	CA 8.2.2, CP 10.2.2	2021	Developmental effect of parental or direct chronic exposure to environmental concentration of glyphosate on the larvae of rainbow trout, Oncorhynchus mykiss.	Aquatic toxicology, (2021), Vol. 237, Article No. 105894	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
3	Le Du-Carree J. et al.	CA 8.2.2, CP 10.2.2	2021	Generational effects of a chronic exposure to a low environmentally relevant concentration of glyphosate on rainbow trout, Oncorhynchus mykiss.	The Science of the total environment, (2021), Vol. 801, Article No. 149462	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
5	Mendes E. J. et al.	CA 8.2.7	2021	Isolated and combined effects of glyphosate and its by-product aminomethylphosphonic acid on the physiology and water remediation capacity of Salvinia molesta.	Journal of hazardous materials, (2021), Vol. 417, Article No. 125694.	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.
6	Vera M. S. et al.	CA 8.2.8	2021	First evaluation of the periphyton recovery after glyphosate exposure.	Environmental pollution, (2021), Vol. 290, Article No. 117998	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
10	Wee J. et al.	CP 10.4.2.1	2021	Temperature and Aging Affect Glyphosate Toxicity and Fatty Acid Composition in Allonychiurus kimi (Lee) (Collembola).	Toxics, (2021), Vol. 9, No. 6	The article has been classified as relevant by full text - Category A and reliable with restrictions: A detailed summary for this article is provided.

Table 34: Relevant but supplementary (category B) articles after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
11	CA 5.4.1	Nagy K. et al.	2021	Micronucleus Formation Induced by Glyphosate and Glyphosate-Based Herbicides in Human Peripheral White Blood Cells.	Frontiers in public health, (2021) Vol. 9, Article No. 639143	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article provides information on the genotoxicity profile of glyphosate. Glyphosate a.s. and 3 GBHs were tested. Roundup Mega containing ethoxylated etheralkylamine), Glyfos containing polyethoxylated tallow amine and Fozat containing a wetting agent C12-14-alkyldimethyl betaine. Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure (e.g. ethoxylated etheralkylamine), are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason and the fact that the formulations tested contain ethoxylated etheralkylamine (similar chemical structure to POEA), POEA and betaine (not present in the AIR5 glyphosate representative formulation), the article is not considered relevant for use in risk assessment for the formulations as the effects observed cannot be attributed to glyphosate a.s. The article nevertheless presents relevance with regard to pure glyphosate. The study did not fully adhere to OECD 487, including, the purity of glyphosate is missing, no HCD available and no concurrent positive controls. Following AIR2 approval, however, all glyphosate formulations were required to be tested for clastogencity using OECD 487 for re-approval under Article 43, and the quality of reporting in these studies should be compared with the results presented within this paper.
12	CA 5.6, CA 5.7	Cattani D. et al.	2021	Perinatal exposure to a glyphosate-based herbicide causes dysregulation of dynorphins and an increase of neural precursor cells in the brain of adult male rats.	Toxicology, (2021), Vol. 461, Article No. 152922	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the effect of a glyphosate formulation on neurodevelopmental processes associated to long-term brain changes. Only one dose/no dose-response relationship. No HCD reported and no method of analysis.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
13	CA 5.7	Bicca Ferreira D. et al.	2021	A subchronic low-dose exposure of a glyphosate-based herbicide induces depressive and anxious-like behavior in mice: quercetin therapeutic approach.	Environmental science and pollution research international, (2021), Vol. 28, pp. 67394-67403	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the effect of a glyphosate formulation on the central nervous system and the therapeutic effect of the flavonoid quercetin. Only one dose/no dose-response relationship. No HCD reported and no method of analysis.
14	CA 5.8	Pu Y. et al.	2021	Autism-like Behaviors in Male Juvenile Offspring after Maternal Glyphosate Exposure.	Clinical psychopharmacology and neuroscience : the official scientific journal of the Korean College of Neuropsychopharmacology, (202), Vol. 19, No. 3, pp. 554-55	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability.** The aim of the study was to investigate whether maternal exposure of pure glyphosate could cause ASD-like behaviours in juvenile offspring. Water or 0.098% glyphosate (980 mg/L) was administered as drinking water from E5 to P21 (weaning). This level of glyphosate acid in water has a very low pH of approximately 2.3, which may confound the results of the test due to either pH effects on the gastrointestinal tract, or reduced water consumption in the test group causing some degree of dehydration. Male offspring showed ASD-like behavioural abnormalities (i.e., increasing grooming behaviour and social interaction deficit) after maternal exposure of glyphosate. Purity of the active substance missing. Only one dose, no dose-response relationship established, number of animals/group is unclear. Dosing level in water is at least several orders of magnitude higher than worst case human dietary exposures and pH of dose group water is very low. Key parameters of water and food consumption not reported. No record of in-life clinical observations. No HCD reported and no method of analysis. No positive controls employed to verify the validity or accuracy of the method and therefore the relevance to human health assessments is at best tenuous.
15	CA 5.8	Qiu S. et al.	2021	Response of the nuclear xenobiotic receptors to alleviate glyphosate-based herbicide-induced nephrotoxicity in weaned piglets.	Environmental science and pollution research international, (2021), Vol. 29, pp. 2707-2717	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the effect of Roundup on piglet kidneys. The study also investigates the role of kidney nuclear xenobiotic receptors. The piglet is not a model validated in the toxicological studies in the EU evaluations, however the information can still be used as supplementary. No dose-effect relationship. No HCD reported and no method of analysis.
16	CA 5.8	Sopko B. et al.	2021	Glyphosate Interaction with eEF1α1 Indicates Altered Protein Synthesis: Evidence for Reduced Spermatogenesis and Cytostatic Effect.	ACS omega, (2021), Vol. 6, No. 23, pp. 14848-14857	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The paper is a review of the literature that provides information on the mode of action of glyphosate via interaction with eEF1α1 pathway and spermatogeneis and cytostatis effects through a combination of in silico, in vitro and in vivo information. The aim of the study was to evaluate a previously unknown mechanism to explain a

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						presumption that glyphosate exposure can negatively affect animals, including humans. Computer modeling suggested a probable interaction between glyphosate and eukaryotic translation elongation factor 1 subunit alpha 1 (eEF1α1), which was said to be confirmed by microcalorimetry, however, details on the calorimetry method are lacking, including concentration(s) of glyphosate interrogated. Only restricted, nondisrupted spermatogenesis was reported in rats after 100 days (i.e. subchronic, not chronic as reported) glyphosate treatments (0.7 and 7 mg/L ad libitum in drinking water). Although the method notes water consumption was monitored, neither water consumption or feed intake were reported. It is important to note, glyphosate is acidic and dose groups drinking water would be a much lower pH than the control group. Only two dose groups were implemented. The results are not consistent with a number of multigenerational rat reproductive studies with doses up to orders of magnitude higher. Cytostatic and antiproliferative effects of glyphosate in GC-1 and SUP-B15 cells were indicated. The meta-analysis of public health data suggested a possible effect of glyphosate use on sperm count, but this is not consistent with reporting in with epidemiology studies or multiple toxicology reproductive studies. Information on purity missing for the pure glyphosate. No HCD. Numerous deficiencies in the in vivo portion and significant underlying assumption in the in silico and meta-analysis.
17	CA 5.8	Truzzi F. et al.	2021	Comparative Evaluation of the Cytotoxicity of Glyphosate-Based Herbicides and Glycine in L929 and Caco2 Cells.	Frontiers in public health, (2021) Vol. 9, Article No. 643898	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This article provides supplementary information on the cytotoxicity of glyphosate but does not alter the risk assessment. No positive control, no metabolic activation. No HCD.
18	CA 5.8.2	Almeida L. L. et al.	2021	Protective effect of melatonin against herbicides-induced hepatotoxicity in rats.	Toxicology Research, (2021), Vol. 10, No. 1, pp. 1-10	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides supplementary information on the ability of melatonine to ameliorate toxic effects of glyphosate on the liver. No information on feed and housing conditions, content of test material not available. Several effects observed are from the mixture of Paraquat with Roundup® (i.e. mixture toxicity). There is only one dose/no dose-response relationship. Finally, there is no HCD reported and no method of analysis.
19	CA 5.9	Boffetta P. et al.	2021	Exposure to glyphosate and risk of non-Hodgkin lymphoma: an updated meta-analysis.	La Medicina del lavoro, (2021), Vol. 112, No. 3, pp. 194-199.	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This is a review article, not primary research on a study population. The meta-analysis approach was standard. However, meta-analysis cannot correct for the validity limitations in the included studies, which precludes

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						calculating a valid assessment of the possible relationship between glyphosate and non-Hodgkin's lymphoma. Limited in several of the included case control studies. Especially limited in Leon et al. (2019) where the exposure assessment was based on crops farmed for 84% of the pooled cohort of 316,270. The indirect methodology made it impossible to discriminate those not exposed to specific pesticides or to know with reasonable certainty those exposed to specific pesticides. In addition, date of first exposure would be unknown for crops originally treated with other pesticides and subsequently treated with glyphosate. In fact, it seems likely that the majority of those judged to have been exposed to most specific pesticides were, in fact, not exposed when there were several pesticides registered for use on specific crops. Cases were more likely to participate than controls in several of the case control studies included in the meta-analysis. There was a substantial amount of second-hand information in several of the case control studies. The meta-analysis was not able to address biases in the included studies, especially recall bias, selection bias, and residual confounding.
20	CA 5.9	He Xiu et al.	2021	The relationship between pesticide exposure during critical neurodevelopment and autism spectrum disorder: A narrative review.	Environmental research, (2021), Vol. 203, Article No. 111902	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This is a narrative review article, not an epidemiologic study. There is no study design or study population per se. The two glyphosate epidemiology studies cited in this review involve very unlikely exposure scenarios. One study correlated increasing glyphosate use on crops with increases in the general population rate of autism. The second study defined exposure as proximity of the mother's residence on the birth certificate within a 2,000-meter radius of a glyphosate application recorded in the California Pesticide Use Reporting system. Even assuming the mother was home at the address on the birth certificate at the time of application, no one has ever demonstrated glyphosate exposure at appreciable distances from an application. There was no consideration of personal confounding factors in one study and very limited consideration in the other study. The assessment of autism risk from glyphosate exposure is based on two studies with very unlikely exposure scenarios. Therefore, this review does not provide reliable evidence about a possible association between glyphosate and autism.
21	CA 5.9	Lesseur C. et al.	2021	Urinary glyphosate concentration in pregnant women in relation to length of	Environmental research, (2021), Vol. 203, Article No. 111811	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This study was not designed to study glyphosate per se. The authors took advantage of an ongoing study (TIDES) that had collected a 2nd trimester urine sample from pregnant women to evaluate a possible relationship

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
				gestation.		between glyphosate (and AMPA) in urine and length of gestation and pre-term birth. Had the study been designed for glyphosate per se, it is unlikely that a single urine sample would have been planned as the basis for the analysis and other potential environmental exposures in urine or blood would have been assessed. The authors took the opportunity to generate some data about glyphosate (and AMPA) and length of gestation from a study that was designed for other purposes. Adapting data from an ongoing study is efficient and it can be informative when the data collection from the ongoing study matches what would have been collected for a high-quality study of the question at hand. In most instances, however, it results in a study that has important limitations. It is debatable whether pregnant women who come to the 4 university hospitals in the TIDES study is an optimum population for the study of glyphosate and length of gestation. Urine concentrations for these women equate to a glyphosate internal dose that is extremely low – 0.0008 mg/kg or 0.2% of the European ADI – raising the issue of biological implausibility. Also, taking the analysis at face value requires the strong assumption that a single 2nd trimester urine sample reflects the amount of exposure during the etiologically meaningful time period for affecting length of gestation. The authors did not provide a justification for the adequacy of a single 2nd trimester urine sample. It is also worth noting that there are literally hundreds of chemicals that could have been measured in urine (or blood) to study length of gestation. One normally would not choose to focus on such low levels of glyphosate over other internalized chemicals for the study participants and it can be argued that some of those other exposures would have been important to consider in the analyses. The results of the authors' many analyses differed depending on the specific comparisons being made. Median exposure levels did not differ when outcomes were dichotomized as pre and full term. For the overall population, gestational age was not related to glyphosate values (hazard ratio (HR) 1.08, 95% CI 0.91, 1.29), but there was a weak to moderate association when the analysis was restricted to births that were not medically induced (HR 1.31, 95% CI 1.00, 1.71). The authors noted that 41% of births were medically induced, so presumably the HR for those women was somewhat less than 1.0. Likewise, when length of gestation was dichotomized as pre and full term, the odds ratio (OR) for glyphosate for all births was 1.19 (95% CI 0.86, 1.64) and the OR was 1.54 (95% CI 0.97, 2.57) when restricted to births that were

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						not medically induced. Again, it seems likely that the measure of association was somewhat less than 1.0 for the women who were medically induced. On balance, the results did not show a consistent relationship for glyphosate and length of gestation or pre-term birth and the interpretation of the results for those women who were medically induced is uncertain. The various analyses controlled for relatively few personal factors and no environmental factors. One can only speculate whether the results may have residual confounding. In conclusion, the results have very limited relevance for a glyphosate risk assessment. First, it's unclear whether the urine sampling is a valid representation of the internal dose at a relevant time point for the health outcome under study. Second, the range of internal doses for study participants was so low as to suggest biological implausibility. Third, the findings were based on small numbers and varied across a range of analyses, some showing no association and some showing a weak to moderate association. Lastly, there was limited consideration of confounding factors, both personal and environmental.
22	CA 5.9	Odutola M. K. et al.	2021	A systematic review and meta-analysis of occupational exposures and risk of follicular lymphoma	Environmental Research, (2021), Vol. 197, Article No. 110887	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This is a review article of the literature for numerous exposures, including glyphosate, and follicular lymphoma. It is not primary data. The authors used standard meta-analysis routines. However, they had no ability to correct for limitations in the original studies. It seems that the authors had only a superficial knowledge of the details and quality limitations of many of the glyphosate studies because they concluded that the risk of bias was low (viz., systematic error) – other than the small number of cases (viz., random error). Most previous reviewers of glyphosate studies considered the risk of bias to be high for most of the studies.
23	CA 5.9	Silver M. K. et al.	2021	Prenatal Exposure to Glyphosate and Its Environmental Degradate, Aminomethylphosphonic Acid (AMPA), and Preterm Birth: A Nested Case-Control Study in the PROTECT Cohort (Puerto Rico).	Environmental health perspectives, (2021), Vol. 129, No. 5, Article No 57011.	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The authors took the opportunity to generate some data about glyphosate (and AMPA) and preterm birth from a cohort (PROTECT) study that was designed for other purposes than glyphosate per se. Adapting data from an ongoing study is efficient and it can be informative when the data collection from the ongoing study matches what would have been collected during a high-quality study of the question at hand. In most instances, however, the result is studies that have important limitations in study size or necessary information on personal factors and confounders. It is debatable whether pregnant women in the PROTECT cohort, patients at two university hospitals and 5 nearby clinics in northern Puerto Rico, are an

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						optimum population for the study of glyphosate and pre-term birth. Urine concentrations for these women equate to a glyphosate internal dose that is extremely low – a few percent or less of the European ADI – raising the issue of biological implausibility. Also, taking the analysis at face value requires the strong assumption that one or two 2nd trimester urine sample(s) reflects the amount of exposure during the etiologically meaningful time period for affecting length of gestation. The authors did not provide a justification for the adequacy of a single or two 2nd trimester urine sample(s). It is also worth noting that there are literally hundreds of chemicals that could have been measured in urine (or blood) to study length of gestation. One normally would not choose to focus on such low levels of glyphosate over other possible internalized chemicals for the study participants and it can be argued that some of those other exposures would have been important to consider in the analyses. This was noted as a limitation by the authors. The results of the authors' various analyses differed depending on the specific comparison being made. Analyses based on the visit 3 urine samples showed a weak to moderate relationship between glyphosate and pre-term birth, whereas analyses based on the visit 1 urine sample or the average of the visit 1 and 3 urine samples showed near null odds ratios. On balance, the results did not show a consistent relationship between urinary concentration of glyphosate and pre-term birth. The various analyses controlled for relatively few personal factors and environmental factors. One can only speculate whether the results may have residual confounding. In conclusion, the results of this study have very limited relevance for a glyphosate risk assessment. First, it's unclear whether the urine sampling is a valid representation of the internal dose at a relevant time point for the health outcome under study. Second, the range of internal doses for study participants was so low as to suggest biological implausibility. Third, the findings are based on small numbers of cases and varied across a range of analyses, some showing no association and some showing a weak to moderate association. Lastly, there was limited consideration of confounding factors.
24	CA 5.9	Yokoyama S. et al.	2021	Transient glyphosate encephalopathy due to a suicide attempt.	Neuropsychopharmacology reports, (2021), Vol. 41, No. 3, pp. 444-447	The article has been classified as relevant by full text - Category B for the following reason: This is a case report of a man who developed a delayed encephalopathy characterized by confusion seizure activity and decreased perfusion of his left cerebral hemisphere on SPECT 3 days after a suicidal ingestion of formulated glyposate. On intial presentation the patient was asymptomatic, underwent gasric lavage, which is not indicated in

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						an asymptomatic patient, and was admitted to the psychiatric floor. 3 days later he as noted to have a delirium for which he was treated with mirtazipine. This was discontinued when symptoms grew progessively worse. The authors speculate that the cause of the encephalopathy was glyphosate. This is highly unlikely as glyphosate is not neurotoxic, nor does it cause vascular constriction. A unilateral perfusion deficit is very uncommon in a toxin induced encephalopathy. This case is much more consistent with acute alcohol withdrawal, which is a slow onset syndrome that takes 2-3 days to develop, is charcterized by delirium and seizures, reversible vasogenic edema in the hippocampal regions. This presentation is not consistent with glyphosate overdoses and because of the suicidal ingestion should not impact regulatory decisions.
25	CA 5.9	Zhang C. Q. et al.	2021	A case of allergic cutaneous vasculitis caused by glyphosate.	Chinese journal of industrial hygiene and occupational diseases, (2021), Vol. 39, No. 6, pp. 467-468	The article has been classified as relevant by full text - Category B for the following reason: This is a case report of a man who developed purpuric skin lesions involving the palms and leukocytoclastic vasculitis after exposure to an agrichemical that was reported to be glyphosate. His symptoms improved with steroid therapy, recurred upon reexposure 2 times and resolved with steoid treatment. The article claims that the chemistry involved was glyphosate despite the fact that there was no confirmation of exposure through any definitive identification of the product, urine or blood testing for the presence of glyphosate. Glyphosate is not a sensitizer, nor does it cause immune complex deposition in the vasculature. While the patient was worked up for several diseases associated leukocytoclastic vasculitis, they left out several very prominent infectious etiologies that are much more commonly associated with palmar rashes and vasculitidies. There is no described mechanism in the literature for this constellation of symptoms and no confirmation that the patient was exposed to glyphosate.
26	CA 6.10	Bergero M. et al.	2021	Agrochemical Contamination of Honey and Bee Bread Collected in the Piedmont Region, Italy	Environments, (2021), Vol. 8, No. 7	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Monitoring data from Piedmont (Italy) on pesticides in bee bread and honey (sampling from 4 apiaries). Glyphosate was the most abundant chemical found in bee bread and honey samples, with levels of <10-542 and 10-34 µg/kg, respectively. Analysis of glyphosate in honey was done according to QuPPe M 1.3 method, however no method validation data are provided in the publication.
27	CA 6.10	Krogh U. et al.	2021	Performance and mineral status of weaning pigs fed diets with different levels of glyphosate	Livestock Science, (2021), Vol. 252, Article No. 104681	The article has been classified as relevant by full text - Category B and reliable without restrictions: This is an experimental study to investigate effects of glyphosate on performance and mineral status of weaning pigs (weight, feed intake and faeces score; intestine

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
				and tryptophan.		digesta, blood and urine analysis). Pigs were fed with wening diet containing various concentrations (20 and 200 mg/kg) of glyphosate, at the highest concentration with and without addition of crystalline tryptophan. Neither feed intake, growth rate, serum mineral concentrations nor faeces score were significantly affected by level or source (pure glyphosate salt vs GBH) of the dietary glyphosate. Well described experimental study on the effect of glyphosate on the performance and mineral status of weaning pigs.
28	CA 6.10	Sorensen M. T. et al.	2021	Feed residues of glyphosate - potential consequences for livestock health and productivity.	Animal, (2021), Vol. 15, No. 1	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This is a literature review report on potential detrimental effects of glyphosate affect livestock gut microbiota and/or mineral status potentially with derived unfavourable effects on animal health and productivity. Some in vitro growth experiments were conducted with bacteria. Some differences were detected regarding the sensitivity of bacterial growth to glyphosate. The in vitro bacterial growth assays can be considered acceptable. However the new experimental data are limited and provide little additional information to existing studies (also in vivo studies) to this topic.
29	CA 6.3	Edge C. B. et al.	2021	The Persistence of Glyphosate in Vegetation One Year after Application	FORESTS, (2021), Vol. 12, No. 5.	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study describes two experiments conducted in Canada, where glyphosate was applied aerially at rates of 1.35-1.8 kg a.s./ha to forestry areas. Samples of vegetation browsed by deer, moose and bear were collected from sprayed and non-sprayed adjacent blocks (down-wind), and analysed for residues of glyphosate and AMPA. Overall, the studies demonstrate that trace levels of glyphosate persist in vegetation for up to one year after application, however, observed concentrations are unlikely to pose risk to wildlife. Analytical work was done at the Agriculture and Food Laboratory at the University of Guelph by means of LC-MS/MS, however no method description and validation data are provided.
30	CA 6.3	Jin Shan et al.	2021	Analysis on pesticide residues level in dry tea materials of Chenxiang Tieguanyin and the preliminary studies on the degradation of pesticide residues.	Journal of Chinese Institute of Food Science and Technology, (2021), Vol. 21, pp. 291-29	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Monitoring data from China on pesticides in oolong tea (Chenxiang Tieguanyin, 89 raw materials analysed). Glyphosate was detected in 13 samples at levels of 0.07-0.79 mg/kg, i.e. below EU and China MRL (2 and 1 mg/kg, respectively). Analytical work was done at the Fujian Inspection and Research Institute for Product Quality by means of LC MS/MS (according to Chinese Standard GB/T 23204-2008), however no method validation data are provided.
31	CA 6.3	Malone M.	2021	Seeking justice, eating toxics: overlooked contaminants in	AGRICULTURE AND HUMAN VALUES, (2021)	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This is a

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
				urban community gardens	https://doi.org/10.1007/s10460-021-10236-8	kind of monitoring study in urban community gardens (UCGs), where soil from nine UCGs around Seattle were sampled and analysed for As, Pb, glyphosate and AMPA, and total petroleum hydrocarbons (TPH). Glyphosate and AMPA were found preliminary at two sites. Maximum levels of glyphosate and AMPA were 0.108 and 0.613 mg/kg, respectively, with highest median values of 0.027 and 0.163 mg/kg. Analytical work was done by HRI Laboratories in Iowa by means of LC MS/MS, however no method validation data are provided for soil analyses.
32	CA 6.9	Baudry J. et al.	2021	Estimated dietary exposure to pesticide residues based on organic and conventional data in omnivores, pesco-vegetarians, vegetarians and vegans	Food and Chemical Toxicology, (2021), Vol. 153, Article No. 112179	The article has been classified as relevant by full text - Category B and reliable without restrictions: This is a dietary risk assessment study to investigate uptake of reisidues (incl glyphosate) by different population groups, including omnivores, pesco-vegetarians, vegetarians and vegans, with further distincion between intake of conventional or organic food source. Highest glyphosate intakes of glyphosate were calculated for vegans consuming conventional food (0.0264 µg/kg bw/day), with highest contributor legume vegetables. The study uses data from the NutriNet-Santé study (consumption survey 2013) and pesticide residue data from Chemisches und Veterinäruntersuchungsamt (CVUA) Stuttgart database. The study shows no risks to all consumer groups from glyphosate residues.
33	CA 6.9	Vicini J. L. et al.	2021	Residues of glyphosate in food and dietary exposure.	Comprehensive reviews in food science and food safety, (2021): Ahead of Print	The article has been classified as relevant by full text - Category B and reliable without restrictions: This is a literature review article with focus on 1) analytical methods for glyphosate and AMPA, 2) MRL and monitoring data (market surveys) and 3) dieatry risk assessment. It reflects a well written summary of available knowledge and regulatory requirements/assessments. Scientifically solid overall assessment of glyphosate consumer risk from glyphosate and AMPA.
34	CA 6.9	Wang Y. et al.	2021	Establishment of a HPLC-MS/MS Detection Method for Glyphosate, Glufosinate-Ammonium, and Aminomethyl Phosphoric Acid in Tea and Its Use for Risk Exposure Assessment.	Journal of agricultural and food chemistry, (2021), Vol. 69, No. 28, pp. 7969-7978	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article describes 1) development and optimisation of an analycal method for the determation of glyphosate, AMPA and glufosinate-ammonium, 2) monitoring of tea samples (n = 780) from China, and 3) risk assessment (deterministic and probabilistic) from consumption of teas. The results showed that exposure to PMG, GLU and AMPA caused by drinking tea beverages poses no significant risk to human health. Regarding analytical procedures, it is stated that LOQ for Gly and AMPA was 0.3 mg/kg (derived from calibration standards); however the lowest validated concentration was 1.0 mg/kg.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
35	CA 7.1.4.1	Akyol N. H. et al.	2021	Comparison of sorption and solute transport behaviour of several herbicides in an alkaline agricultural soil	International Journal of Environmental Analytical Chemistry (2021): Ahead of Print	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The objective of this study was to quantify sorption and solute transport of glyphosate in soil column experiments with an alkaline agricultural soil from Turkey. The adsorption coefficient (Kd) for glyphosate was estimated to be 2.14 L/kg. The soil sampling procedure (e.g. depth and timing), soil storage and pesticide history of the soils are not reported. Soil columns (10-cm long by 2-cm diameter) were smaller than required by the guideline (at least 4 cm and a minimum height of 35 cm). The experiments were conducted in saturated columns with flow from bottom to top at a rate of 0.7 mL/min. Test concentrations were high with 20 to 100 mg/L. Only the column effluent was analysed, soil segments were not analysed. Sample analysis was performed using an UV spectrometer with a detection limit of 0.1 mg/L.
36	CA 7.1.4.3	Giuliano S. et al.	2021	Reducing herbicide use and leaching in agronomically performant maize-based cropping systems: An 8-year study.	The Science of the total environment, (2021), Vol. 788, Article No. 147695	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. An 8-year field leaching experiment was carried out at the Domaine de Lamothe - INP PURPAN, Garonne Plain, south-western France (43.506N, 1.237E) from 2011 to 2018. Different cropping systems were compared. Glyphosate and AMPA were detected in less than 50% of the samples and had very low frequencies of leachates with concentration above 1 µg/L (respectively 5% and 0%). No information on the test substance (formulation, purity), the exact application time and the application method is given. Only leachate but no soil samples were analysed. The volume and sampling time of the leachate is not reported. Furthermore, only maximum concentrations of glyphosate and AMPA were reported. It is not reported when (year, season) the maximum concentrations were observed and thus it cannot be connected to glyphosate application or climatic conditions.
37	CA 7.5	Fernandes B. et al.	2020	Levels of glyphosate in vineyard soils and potential adverse effects to the environment.	IOBC/WPRS Bulletin, (2020), No. 154, pp. 129-132	The article has been classified as relevant by full text and downgraded to Category B due to its non-reliability. The levels of glyphosate and AMPA were monitored in two different vineyards from the Douro Demarcated Region (Portugal) over one year from February 2018 to January 2019. The highest concentrations of glyphosate were observed in February (median value of 2.0 mg/kg). The exact location of the vineyards and the weather conditions are not reported. The application method and rate of the glyphosate formulation as well as the formulation type are not described. No information on soil sampling procedure, depth, sample storage and extraction method is provided. The analytical method is not described with sufficient details and was not validated. No individual concentrations are reported, but only

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						median values and they cannot be assigned to a geographic area.
38	CA 8.1.4	Lopes A. et al.	2021	Evaluation of the genotoxic, mutagenic, and histopathological hepatic effects of polyoxyethylene amine (POEA) and glyphosate on Dendropsophus minutus tadpoles.	Environmental pollution, (2021), Vol. 289, Article No. 117911	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for amphibians (it cannot be integrated into the risk assessment scheme), but its findings can be used as higher tier supportive information in a broader discussion of the effects of glyphosate on vertebrate wildlife. A quantitative endpoint can be established but based on effects at cellular/mollecular level (genotoxicity and mutagenicity). For the histopathological effects that are relevant for the risk assessment, only a qualitative evaluation was conducted. The study cannot be considered as fully reliable because no analytical verification of the test concentrations in water was conducted. In addition, tested individuals provide from samples from a permanent body of water in Brazil and no record of previous chemical exposure was provided.
39	CA 8.2.8, CP 10.2.3	de Campos Oliveira R. et al.	2021	Effect of herbicides based on glyphosate on the photosynthesis of green macroalgae in tropical lotic environments	FUNDAMENTAL AND APPLIED LIMNOLOGY, (2021), Vol. 195, No. 2, pp. 85-93	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for algae (it cannot be integrated into the risk assessment scheme because measured variables and endpoints are not in line with the guidance), but its findings can be used as supportive information in a broader discussion of the effects of glyphosate on aquatic organisms (specifically macroalgae). The species tested are widely distributed and frequently reported as representatives of Chlorophyta in lotic macroalgal communities in Brazil. The study is considered reliable with restrictions because it lacks of analytical verifications of the tested item in the test medium during the exposure phase and because the specimens used for the test come from natural sources and no evidence was provided that they were not previously exposed to pesticides.
40	CA 8.7, CP 10.7	Lorch M. et al.	2021	Repeated annual application of glyphosate reduces the abundance and alters the community structure of soil culturable pseudomonads in a temperate grassland	Agriculture, ecosystems & environment, (2021), Vol. 319, Article No. 107503	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters (it cannot be integrated into the risk assessment scheme), but its findings can be used as higher tier supportive information in a broader discussion of the effects of glyphosate on soil microorganisms. The part of the study conducted in the field is not relevant, because it was conducted in a humid mesophytic meadow of a commercial farm located in Argentina. This is not relatable to the EU risk assessment, because

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						the conditions are not representative. The part of the study conducted in the greenhouse is relevant, but it was conducted at only one rate (the same for both pure glyphosate and the GBH). The concentration of glyphosate in the soil was not analyzed. The study is considered as reliable with restrictions because no analytical verifications of the concentration of glyphosate in soil samples were conducted. In addition, the characterization of the soil was not provided (just texture) and the application volume was not reported.
41	CP 10.3.1.4	Hernandez J. et al.	2021	Sublethal doses of glyphosate impair olfactory memory retention, but not learning in the honey bee (Apis mellifera scutellata)	JOURNAL OF INSECT CONSERVATION, (2021), Vol. 25, No. 4, pp. 683-694	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for bees (it cannot be integrated into the risk assessment scheme), but its findings can be used as supportive information (olfactory learning and memory) in a broader discussion on the sub-lethal effects of glyphosate on bees. The study is considered as reliable with restrictions because it is uncertain whether the bees have been previously exposed to pesticides, because no analytical verifications of the stock solution were conducted and because the test temperature (20°C) is low for honey bees (should have been ca. 33°C). In addition, only 2 concentration (0.375 and 1.5 µg/bee) were tested (under both acute and repeated exposure conditions).
42	CP 10.5	Jezierska-Tys S. et al.	2021	Microbiological Nitrogen Transformations in Soil Treated with Pesticides and Their Impact on Soil Greenhouse Gas Emissions	AGRICULTURE-BASEL, (2021), Vol. 11, No. 8.	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for soil microorganisms (it cannot be integrated into the risk assessment scheme), but its findings can be used as higher tier supportive information in a broader discussion of the effects of glyphosate on soil nitrogen transformation (nitrification) under realistic field conditions. The study is considered as not reliable because the record of the previous exposure to other chemicals in the field where the soil samples were taken is not reported and no analytical verifications of the concentration of glyphosate in soil samples were conducted. It is therefore not possible to link univocally the glyphosate application with the observed effects in soil nitrification. In addition, the incubation conditions of the soil were not reported. Furthermore, the test item was poorly described. Precipitations regime between application and soil sampling was not described.

Table 35: Relevant but supplementary (category B) articles after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
35	Akyol N. H. et al.	CA 7.1.4.1	2021	Comparison of sorption and solute transport behaviour of several herbicides in an alkaline agricultural soil	International Journal of Environmental Analytical Chemistry (2021): Ahead of Print	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The objective of this study was to quantify sorption and solute transport of glyphosate in soil column experiments with an alkaline agricultural soil from Turkey. The adsorption coefficient (Kd) for glyphosate was estimated to be 2.14 L/kg. The soil sampling procedure (e.g. depth and timing), soil storage and pesticide history of the soils are not reported. Soil columns (10-cm long by 2-cm diameter) were smaller than required by the guideline (at least 4 cm and a minimum height of 35 cm). The experiments were conducted in saturated columns with flow from bottom to top at a rate of 0.7 mL/min. Test concentrations were high with 20 to 100 mg/L. Only the column effluent was analysed, soil segments were not analysed. Sample analysis was performed using an UV spectrometer with a detection limit of 0.1 mg/L.
18	Almeida L. L. et al.	CA 5.8.2	2021	Protective effect of melatonin against herbicides-induced hepatotoxicity in rats.	Toxicology Research, (2021), Vol. 10, No. 1, pp. 1-10	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The article provides supplementary information on the ability of melatonine to ameliorate toxic effects of glyphosate on the liver. No information on feed and housing conditions, content of test material not available. Several effects observed are from the mixture of Paraquat with Roundup® (i.e. mixture toxicity). There is only one dose/no dose-response relationship. Finally, there is no HCD reported and no method of analysis.
32	Baudry J. et al.	CA 6.9	2021	Estimated dietary exposure to pesticide residues based on organic and conventional data in omnivores, pesco-vegetarians, vegetarians and vegans	Food and Chemical Toxicology, (2021), Vol. 153, Article No. 112179	The article has been classified as relevant by full text - Category B and reliable without restrictions: This is a dietary risk assessment study to investigate uptake of reisidues (incl glyphosate) by different population groups, including omnivores, pesco-vegetarians, vegetarians and vegans, with further distincion between intake of conventional or organic food source. Highest glyphosate intakes of glyphosate were calculated for vegans consuming conventional food (0.0264 µg/kg bw/day), with highest contributor legume vegetables. The study uses data from the NutriNet-Santé study (consumption survey 2013) and pesticide residue data from Chemisches und Veterinäruntersuchungsamt (CVUA) Stuttgart database. The study shows no risks to all consumer groups from glyphosate residues.
26	Bergero M. et al.	CA 6.10	2021	Agrochemical Contamination of Honey and Bee Bread Collected in the Piedmont Region, Italy	Environments, (2021), Vol. 8, No. 7	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Monitoring data from Piedmont (Italy) on pesticides in bee bread and honey (sampling from 4 apiaries). Glyphosate was the most abundant

						chemical found in bee bread and honey samples, with levels of <10-542 and 10-34 µg/kg, respectively. Analysis of glyphosate in honey was done according to QuPPe M 1.3 method, however no method validation data are provided in the publication.
13	Bicca Ferreira D. et al.	CA 5.7	2021	A subchronic low-dose exposure of a glyphosate-based herbicide induces depressive and anxious-like behavior in mice: quercetin therapeutic approach.	Environmental science and pollution research international, (2021), Vol. 28, pp. 67394-67403	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the effect of a glyphosate formulation on the central nervous system and the therapeutic effect of the flavonoid quercetin. Only one dose/no dose-response relationship. No HCD reported and no method of analysis.
19	Boffetta P. et al.	CA 5.9	2021	Exposure to glyphosate and risk of non-Hodgkin lymphoma: an updated meta-analysis.	La Medicina del lavoro, (2021), Vol. 112, No. 3, pp. 194-199.	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This is a review article, not primary research on a study population. The meta-analysis approach was standard. However, meta-analysis cannot correct for the validity limitations in the included studies, which precludes calculating a valid assessment of the possible relationship between glyphosate and non-Hodgkin's lymphoma. Limited in several of the included case control studies. Especially limited in Leon et al. (2019) where the exposure assessment was based on crops farmed for 84% of the pooled cohort of 316,270. The indirect methodology made it impossible to discriminate those not exposed to specific pesticides or to know with reasonable certainty those exposed to specific pesticides. In addition, date of first exposure would be unknown for crops originally treated with other pesticides and subsequently treated with glyphosate. In fact, it seems likely that the majority of those judged to have been exposed to most specific pesticides were, in fact, not exposed when there were several pesticides registered for use on specific crops. Cases were more likely to participate than controls in several of the case control studies included in the meta-analysis. There was a substantial amount of second-hand information in several of the case control studies. The meta-analysis was not able to address biases in the included studies, especially recall bias, selection bias, and residual confounding.
12	Cattani D. et al.	CA 5.6, CA 5.7	2021	Perinatal exposure to a glyphosate-based herbicide causes dysregulation of dynorphins and an increase of neural precursor cells in the brain of adult male rats.	Toxicology, (2021), Vol. 461, Article No. 152922	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the effect of a glyphosate formulation on neurodevelopmental processes associated to long-term brain changes. Only one dose/no dose-response relationship. No HCD reported and no method of analysis.
39	de Campos Oliveira R. et al.	CA 8.2.8, CP 10.2.3	2021	Effect of herbicides based on glyphosate on the photosynthesis of green macroalgae in tropical lotic environments	FUNDAMENTAL AND APPLIED LIMNOLOGY, (2021), Vol. 195, No. 2, pp. 85-93	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for algae (it cannot be integrated into the risk assessment scheme because measured variables and endpoints are not in line with the guidance), but its findings can be used as supportive information in a broader discussion of the

						effects of glyphosate on aquatic organisms (specifically macroalgae). The species tested are widely distributed and frequently reported as representatives of Chlorophyta in lotic macroalgal communities in Brazil. The study is considered reliable with restrictions because it lacks of analytical verifications of the tested item in the test medium during the exposure phase and because the specimens used for the test come from natural sources and no evidence was provided that they were not previously exposed to pesticides.
29	Edge C. B. et al.	CA 6.3	2021	The Persistence of Glyphosate in Vegetation One Year after Application	FORESTS, (2021), Vol. 12, No. 5.	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study describes two experiments conducted in Canada, where glyphosate was applied aerially at rates of 1.35-1.8 kg a.s./ha to forestry areas. Samples of vegetation browsed by deer, moose and bear were collected from sprayed and non-sprayed adjacent blocks (down-wind), and analysed for residues of glyphosate and AMPA. Overall, the studies demonstrate that trace levels of glyphosate persist in vegetation for up to one year after application, however, observed concentrations are unlikely to pose risk to wildlife. Analytical work was done at the Agriculture and Food Laboratory at the University of Guelph by means of LC-MS/MS, however no method description and validation data are provided.
37	Fernandes B. et al.	CA 7.5	2020	Levels of glyphosate in vineyard soils and potential adverse effects to the environment.	IOBC/WPRS Bulletin, (2020), No. 154, pp. 129-132	The article has been classified as relevant by full text and downgraded to Category B due to its non-reliability. The levels of glyphosate and AMPA were monitored in two different vineyards from the Douro Demarcated Region (Portugal) over one year from February 2018 to January 2019. The highest concentrations of glyphosate were observed in February (median value of 2.0 mg/kg). The exact location of the vineyards and the weather conditions are not reported. The application method and rate of the glyphosate formulation as well as the formulation type are not described. No information on soil sampling procedure, depth, sample storage and extraction method is provided. The analytical method is not described with sufficient details and was not validated. No individual concentrations are reported, but only median values and they cannot be assigned to a geographic area.
36	Giuliano S. et al.	CA 7.1.4.3	2021	Reducing herbicide use and leaching in agronomically performant maize-based cropping systems: An 8-year study.	The Science of the total environment, (2021), Vol. 788, Article No. 147695	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. An 8-year field leaching experiment was carried out at the Domaine de Lamothe - INP PURPAN, Garonne Plain, south-western France (43.506N, 1.237E) from 2011 to 2018. Different cropping systems were compared. Glyphosate and AMPA were detected in less than 50% of the samples and had very low frequencies of leachates with concentration above 1 µg/L (respectively 5% and 0%). No information on the test substance (formulation, purity), the exact application time and the application method is given. Only leachate but no soil samples were analysed. The volume and sampling time of the leachate is not reported. Furthermore, only maximum concentrations of glyphosate and AMPA were reported.

						It is not reported when (year, season) the maximum concentrations were observed and thus it cannot be connected to glyphosate application or climatic conditions.
20	He Xiu et al.	CA 5.9	2021	The relationship between pesticide exposure during critical neurodevelopment and autism spectrum disorder: A narrative review.	Environmental research, (2021), Vol. 203, Article No. 111902	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This is a narrative review article, not an epidemiologic study. There is no study design or study population per se. The two glyphosate epidemiology studies cited in this review involve very unlikely exposure scenarios. One study correlated increasing glyphosate use on crops with increases in the general population rate of autism. The second study defined exposure as proximity of the mother's residence on the birth certificate within a 2,000-meter radius of a glyphosate application recorded in the California Pesticide Use Reporting system. Even assuming the mother was home at the address on the birth certificate at the time of application, no one has ever demonstrated glyphosate exposure at appreciable distances from an application. There was no consideration of personal confounding factors in one study and very limited consideration in the other study. The assessment of autism risk from glyphosate exposure is based on two studies with very unlikely exposure scenarios. Therefore, this review does not provide reliable evidence about a possible association between glyphosate and autism.
41	Hernandez J. et al.	CP 10.3.1.4	2021	Sublethal doses of glyphosate impair olfactory memory retention, but not learning in the honey bee (Apis mellifera scutellata)	JOURNAL OF INSECT CONSERVATION, (2021), Vol. 25, No. 4, pp. 683-694	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for bees (it cannot be integrated into the risk assessment scheme), but its findings can be used as supportive information (olfactory learning and memory) in a broader discussion on the sub-lethal effects of glyphosate on bees. The study is considered as reliable with restrictions because it is uncertain whether the bees have been previously exposed to pesticides, because no analytical verifications of the stock solution were conducted and because the test temperature (20°C) is low for honey bees (should have been ca. 33°C). In addition, only 2 concentration (0.375 and 1.5 µg/bee) were tested (under both acute and repeated exposure conditions).
42	Jezierska-Tys S. et al.	CP 10.5	2021	Microbiological Nitrogen Transformations in Soil Treated with Pesticides and Their Impact on Soil Greenhouse Gas Emissions	AGRICULTURE-BASEL, (2021), Vol. 11, No. 8.	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for soil microorganisms (it cannot be integrated into the risk assessment scheme), but its findings can be used as higher tier supportive information in a broader discussion of the effects of glyphosate on soil nitrogen transformation (nitrification) under realistic field conditions. The study is considered as not reliable because the record of the previous exposure to other chemicals in the field where the soil samples were taken is not reported and no analytical verifications of the concentration of glyphosate in soil samples were conducted. It is

						therefore not possible to link univocally the glyphosate application with the observed effects in soil nitrification. In addition, the incubation conditions of the soil were not reported. Furthermore, the test item was poorly described. Precipitations regime between application and soil sampling was not described.
30	Jin Shan et al.	CA 6.3	2021	Analysis on pesticide residues level in dry tea materials of Chenxiang Tieguanyin and the preliminary studies on the degradation of pesticide residues.	Journal of Chinese Institute of Food Science and Technology, (2021), Vol. 21, pp. 291-29	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: Monitoring data from China on pesticides in oolong tea (Chenxiang Tieguanyin, 89 raw materials analysed). Glyphosate was detected in 13 samples at levels of 0.07-0.79 mg/kg, i.e. below EU and China MRL (2 and 1 mg/kg, respectively). Analytical work was done at the Fujian Inspection and Research Institute for Product Quality by means of LC MS/MS (according to Chinese Standard GB/T 23204-2008), however no method validation data are provided.
27	Krogh U. et al.	CA 6.10	2021	Performance and mineral status of weaning pigs fed diets with different levels of glyphosate and tryptophan.	Livestock Science, (2021), Vol. 252, Article No. 104681	The article has been classified as relevant by full text - Category B and reliable without restrictions: This is an experimental study to investigate effects of glyphosate on performance and mineral status of weaning pigs (weight, feed intake and faeces score; intestine digesta, blood and urine analysis). Pigs were fed with wening diet containing various concentrations (20 and 200 mg/kg) of glyphosate, at the highest concentration with and without addition of crystalline tryptophan. Neither feed intake, growth rate, serum mineral concentrations nor faeces score were significantly affected by level or source (pure glyphosate salt vs GBH) of the dietary glyphosate. Well described experimental study on the effect of glyphosate on the performance and mineral status of weaning pigs.
21	Lesseur C. et al.	CA 5.9	2021	Urinary glyphosate concentration in pregnant women in relation to length of gestation.	Environmental research, (2021), Vol. 203, Article No. 111811	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This study was not designed to study glyphosate per se. The authors took advantage of an ongoing study (TIDES) that had collected a 2nd trimester urine sample from pregnant women to evaluate a possible relationship between glyphosate (and AMPA) in urine and length of gestation and pre-term birth. Had the study been designed for glyphosate per se, it is unlikely that a single urine sample would have been planned as the basis for the analysis and other potential environmental exposures in urine or blood would have been assessed. The authors took the opportunity to generate some data about glyphosate (and AMPA) and length of gestation from a study that was designed for other purposes. Adapting data from an ongoing study is efficient and it can be informative when the data collection from the ongoing study matches what would have been collected for a high-quality study of the question at hand. In most instances, however, it results in a study that has important limitations. It is debatable whether pregnant women who come to the 4 university hospitals in the TIDES study is an optimum population for the study of glyphosate and length of gestation. Urine

						concentrations for these women equate to a glyphosate internal dose that is extremely low – 0.0008 mg/kg or 0.2% of the European ADI – raising the issue of biological implausibility. Also, taking the analysis at face value requires the strong assumption that a single 2nd trimester urine sample reflects the amount of exposure during the etiologically meaningful time period for affecting length of gestation. The authors did not provide a justification for the adequacy of a single 2nd trimester urine sample. It is also worth noting that there are literally hundreds of chemicals that could have been measured in urine (or blood) to study length of gestation. One normally would not choose to focus on such low levels of glyphosate over other internalized chemicals for the study participants and it can be argued that some of those other exposures would have been important to consider in the analyses. The results of the authors' many analyses differed depending on the specific comparisons being made. Median exposure levels did not differ when outcomes were dichotomized as pre and full term. For the overall population, gestational age was not related to glyphosate values (hazard ratio (HR) 1.08, 95% CI 0.91, 1.29), but there was a weak to moderate association when the analysis was restricted to births that were not medically induced (HR 1.31, 95% CI 1.00, 1.71). The authors noted that 41% of births were medically induced, so presumably the HR for those women was somewhat less than 1.0. Likewise, when length of gestation was dichotomized as pre and full term, the odds ratio (OR) for glyphosate for all births was 1.19 (95% CI 0.86, 1.64) and the OR was 1.54 (95% CI 0.97, 2.57) when restricted to births that were not medically induced. Again, it seems likely that the measure of association was somewhat less than 1.0 for the women who were medically induced. On balance, the results did not show a consistent relationship for glyphosate and length of gestation or pre-term birth and the interpretation of the results for those women who were medically induced is uncertain. The various analyses controlled for relatively few personal factors and no environmental factors. One can only speculate whether the results may have residual confounding. In conclusion, the results have very limited relevance for a glyphosate risk assessment. First, it's unclear whether the urine sampling is a valid representation of the internal dose at a relevant time point for the health outcome under study. Second, the range of internal doses for study participants was so low as to suggest biological implausibility. Third, the findings were based on small numbers and varied across a range of analyses, some showing no association and some showing a weak to moderate association. Lastly, there was limited consideration of confounding factors, both personal and environmental.

38	Lopes A. et al.	CA 8.1.4	2021	Evaluation of the genotoxic, mutagenic, and histopathological hepatic effects of polyoxyethylene amine (POEA) and glyphosate on Dendropsophus minutus tadpoles.	Environmental pollution, (2021), Vol. 289, Article No. 117911	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters for amphibians (it cannot be integrated into the risk assessment scheme), but its findings can be used as higher tier supportive information in a broader discussion of the effects of glyphosate on vertebrate wildlife. A quantitative endpoint can be established but based on effects at cellular/mollecular level (genotoxicity and mutagenicity). For the histopathological effects that are relevant for the risk assessment, only a qualitative evaluation was conducted. The study cannot be considered as fully reliable because no analytical verification of the test concentrations in water was conducted. In addition, tested individuals provide from samples from a permanent body of water in Brazil and no record of previous chemical exposure was provided.
40	Lorch M. et al.	CA 8.7, CP 10.7	2021	Repeated annual application of glyphosate reduces the abundance and alters the community structure of soil culturable pseudomonads in a temperate grassland	Agriculture, ecosystems & environment, (2021), Vol. 319, Article No. 107503	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The study does not provide an endpoint that can establish, modify or refine the risk assesment parameters (it cannot be integrated into the risk assessment scheme), but its findings can be used as higher tier supportive information in a broader discussion of the effects of glyphosate on soil microorganisms. The part of the study conducted in the field is not relevant, because it was conducted in a humid mesophytic meadow of a commercial farm located in Argentina. This is not relatable to the EU risk assessment, because the conditions are not representative. The part of the study conducted in the greenhouse is relevant, but it was conducted at only one rate (the same for both pure glyphosate and the GBH). The concentration of glyphosate in the soil was not analyzed. The study is considered as reliable with restrictions because no analytical verifications of the concentration of glyphosate in soil samples were conducted. In addition, the characterization of the soil was not provided (just texture) and the application volume was not reported.
31	Malone M.	CA 6.3	2021	Seeking justice, eating toxics: overlooked contaminants in urban community gardens	AGRICULTURE AND HUMAN VALUES, (2021) https://doi.org/10.1007/s10460-021-10236-8	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This is a kind of monitoring study in urban community gardens (UCGs), where soil from nine UCGs around Seattle were sampled and analysed for As, Pb, glyphosate and AMPA, and total petroleum hydrocarbons (TPH). Glyphosate and AMPA were found preliminary at two sites. Maximum levels of glyphosate and AMPA were 0.108 and 0.613 mg/kg, respectively, with highest median values of 0.027 and 0.163 mg/kg. Analytical work was done by HRI Laboratories in Iowa by means of LC MS/MS, however no method validation data are provided for soil analyses.
11	Nagy K. et al.	CA 5.4.1	2021	Micronucleus Formation Induced by Glyphosate and Glyphosate-Based Herbicides in	Frontiers in public health, (2021) Vol. 9, Article No. 639143	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The article provides information on the genotoxicity profile of

				Human Peripheral White Blood Cells.		glyphosate. Glyphosate a.s. and 3 GBHs were tested. Roundup Mega containing ethoxylated etheralkylamine), Glyfos containing polyethoxylated tallow amine and Fozat containing a wetting agent C12-14-alkyldimethyl betaine. Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure (e.g. ethoxylated etheralkylamine), are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason and the fact that the formulations tested contain ethoxylated etheralkylamine (similar chemical structure to POEA), POEA and betaine (not present in the AIR5 glyphosate representative formulation), the article is not considered relevant for use in risk assessment for the formulations as the effects observed cannot be attributed to glyphosate a.s. The article nevertheless presents relevance with regard to pure glyphosate. The study did not fully adhere to OECD 487, including, the purity of glyphosate is missing, no HCD available and no concurrent positive controls. Following AIR2 approval, however, all glyphosate formulations were required to be tested for clastogencity using OECD 487 for re-approval under Article 43, and the quality of reporting in these studies should be compared with the results presented within this paper.
22	Odutola M. K. et al.	CA 5.9	2021	A systematic review and meta-analysis of occupational exposures and risk of follicular lymphoma	Environmental Research, (2021), Vol. 197, Article No. 110887	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: This is a review article of the literature for numerous exposures, including glyphosate, and follicular lymphoma. It is not primary data. The authors used standard meta-analysis routines. However, they had no ability to correct for limitations in the original studies. It seems that the authors had only a superficial knowledge of the details and quality limitations of many of the glyphosate studies because they concluded that the risk of bias was low (viz., systematic error) – other than the small number of cases (viz., random error). Most previous reviewers of glyphosate studies considered the risk of bias to be high for most of the studies.
14	Pu Y. et al.	CA 5.8	2021	Autism-like Behaviors in Male Juvenile Offspring after Maternal Glyphosate Exposure.	Clinical psychopharmacology and neuroscience : the official scientific journal of the Korean College of Neuropsychopharmacology,	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability.** The aim of the study was to investigate whether maternal exposure of pure glyphosate could cause ASD-like behaviours in juvenile offspring. Water or 0.098% glyphosate (980 mg/L) was administered as drinking water from E5 to P21 (weaning). This level of glyphosate

					(202), Vol. 19, No. 3, pp. 554-55	acid in water has a very low pH of approximately 2.3, which may confound the results of the test due to either pH effects on the gastrointestinal tract, or reduced water consumption in the test group causing some degree of dehydration. Male offspring showed ASD-like behavioural abnormalities (i.e., increasing grooming behaviour and social interaction deficit) after maternal exposure of glyphosate. Purity of the active substance missing. Only one dose, no dose-response relationship established, number of animals/group is unclear. Dosing level in water is at least several orders of magnitude higher than worst case human dietary exposures and pH of dose group water is very low. Key parameters of water and food consumption not reported. No record of in-life clinical observations. No HCD reported and no method of analysis. No positive controls employed to verify the validity or accuracy of the method and therefore the relevance to human health assessments is at best tenuous.
15	Qiu S. et al.	CA 5.8	2021	Response of the nuclear xenobiotic receptors to alleviate glyphosate-based herbicide-induced nephrotoxicity in weaned piglets.	Environmental science and pollution research international, (2021), Vol. 29, pp. 2707-2717	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article provides supplementary information on the effect of Roundup on piglet kidneys. The study also investigates the role of kidney nuclear xenobiotic receptors. The piglet is not a model validated in the toxicological studies in the EU evaluations, however the information can still be used as supplementary. No dose-effect relationship. No HCD reported and no method of analysis.
23	Silver M. K. et al.	CA 5.9	2021	Prenatal Exposure to Glyphosate and Its Environmental Degradate, Aminomethylphosphonic Acid (AMPA), and Preterm Birth: A Nested Case-Control Study in the PROTECT Cohort (Puerto Rico).	Environmental health perspectives, (2021), Vol. 129, No. 5, Article No 57011.	The article has been classified as relevant by full text - Category B and **not reliable** for the following reason: The authors took the opportunity to generate some data about glyphosate (and AMPA) and preterm birth from a cohort (PROTECT) study that was designed for other purposes than glyphosate per se. Adapting data from an ongoing study is efficient and it can be informative when the data collection from the ongoing study matches what would have been collected during a high-quality study of the question at hand. In most instances, however, the result is studies that have important limitations in study size or necessary information on personal factors and confounders. It is debatable whether pregnant women in the PROTECT cohort, patients at two university hospitals and 5 nearby clinics in northern Puerto Rico, are an optimum population for the study of glyphosate and pre-term birth. Urine concentrations for these women equate to a glyphosate internal dose that is extremely low – a few percent or less of the European ADI – raising the issue of biological implausibility. Also, taking the analysis at face value requires the strong assumption that one or two 2nd trimester urine sample(s) reflects the amount of exposure during the etiologically meaningful time period for affecting length of gestation. The authors did not provide a justification for the adequacy of a single or two 2nd trimester urine sample(s). It is also worth noting that there are literally hundreds of chemicals that could have been measured in urine (or blood) to study length of gestation. One

						normally would not choose to focus on such low levels of glyphosate over other possible internalized chemicals for the study participants and it can be argued that some of those other exposures would have been important to consider in the analyses. This was noted as a limitation by the authors. The results of the authors' various analyses differed depending on the specific comparison being made. Analyses based on the visit 3 urine samples showed a weak to moderate relationship between glyphosate and pre-term birth, whereas analyses based on the visit 1 urine sample or the average of the visit 1 and 3 urine samples showed near null odds ratios. On balance, the results did not show a consistent relationship between urinary concentration of glyphosate and pre-term birth. The various analyses controlled for relatively few personal factors and environmental factors. One can only speculate whether the results may have residual confounding. In conclusion, the results of this study have very limited relevance for a glyphosate risk assessment. First, it's unclear whether the urine sampling is a valid representation of the internal dose at a relevant time point for the health outcome under study. Second, the range of internal doses for study participants was so low as to suggest biological implausibility. Third, the findings are based on small numbers of cases and varied across a range of analyses, some showing no association and some showing a weak to moderate association. Lastly, there was limited consideration of confounding factors.
16	Sopko B. et al.	CA 5.8	2021	Glyphosate Interaction with eEF1α1 Indicates Altered Protein Synthesis: Evidence for Reduced Spermatogenesis and Cytostatic Effect.	ACS omega, (2021), Vol. 6, No. 23, pp. 14848-14857	The article has been classified as relevant by full text and **downgraded to Category B due to its non-reliability**. The paper is a review of the literature that provides information on the mode of action of glyphosate via interaction with eEF1α1 pathway and spermatogeneis and cytostatis effects through a combination of in silico, in vitro and in vivo information. The aim of the study was to evaluate a previously unknown mechanism to explain a presumption that glyphosate exposure can negatively affect animals, including humans. Computer modeling suggested a probable interaction between glyphosate and eukaryotic translation elongation factor 1 subunit alpha 1 (eEF1α1), which was said to be confirmed by microcalorimetry, however, details on the calorimetry method are lacking, including concentration(s) of glyphosate interrogated. Only restricted, nondisrupted spermatogenesis was reported in rats after 100 days (i.e. subchronic, not chronic as reported) glyphosate treatments (0.7 and 7 mg/L ad libitum in drinking water). Although the method notes water consumption was monitored, neither water consumption or feed intake were reported. It is important to note, glyphosate is acidic and dose groups drinking water would be a much lower pH than the control group. Only two dose groups were implemented. The results are not consistent with a number of multigenerational rat reproductive studies with doses up to orders of magnitude higher. Cytostatic and antiproliferative effects of

						glyphosate in GC-1 and SUP-B15 cells were indicated. The meta-analysis of public health data suggested a possible effect of glyphosate use on sperm count, but this is not consistent with reporting in with epidemiology studies or multiple toxicology reproductive studies. Information on purity missing for the pure glyphosate. No HCD. Numerous deficiencies in the in vivo portion and significant underlying assumption in the in silico and meta-analysis.
28	Sorensen M. T. et al.	CA 6.10	2021	Feed residues of glyphosate - potential consequences for livestock health and productivity.	Animal, (2021), Vol. 15, No. 1	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This is a literature review report on potential detrimental effects of glyphosate affect livestock gut microbiota and/or mineral status potentially with derived unfavourable effects on animal health and productivity. Some in vitro growth experiments were conducted with bacteria. Some differences were detected regarding the sensitivity of bacterial growth to glyphosate. The in vitro bacterial growth assays can be considered acceptable. However the new experimental data are limited and provide little additional information to existing studies (also in vivo studies) to this topic.
17	Truzzi F. et al.	CA 5.8	2021	Comparative Evaluation of the Cytotoxicity of Glyphosate-Based Herbicides and Glycine in L929 and Caco2 Cells.	Frontiers in public health, (2021) Vol. 9, Article No. 643898	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: This article provides supplementary information on the cytotoxicity of glyphosate but does not alter the risk assessment. No positive control, no metabolic activation. No HCD.
33	Vicini J. L. et al.	CA 6.9	2021	Residues of glyphosate in food and dietary exposure.	Comprehensive reviews in food science and food safety, (2021): Ahead of Print	The article has been classified as relevant by full text - Category B and reliable without restrictions: This is a literature review article with focus on 1) analytical methods for glyphosate and AMPA, 2) MRL and monitoring data (market surveys) and 3) dieatry risk assessment. It reflects a well written summary of available knowledge and regulatory requirements/assessments. Scientifically solid overall assessment of glyphosate consumer risk from glyphosate and AMPA.
34	Wang Y. et al.	CA 6.9	2021	Establishment of a HPLC-MS/MS Detection Method for Glyphosate, Glufosinate-Ammonium, and Aminomethyl Phosphoric Acid in Tea and Its Use for Risk Exposure Assessment.	Journal of agricultural and food chemistry, (2021), Vol. 69, No. 28, pp. 7969-7978	The article has been classified as relevant by full text - Category B and reliable with restrictions for the following reason: The article describes 1) development and optimisation of an analycal method for the determation of glyphosate, AMPA and glufosinate-ammonium, 2) monitoring of tea samples (n = 780) from China, and 3) risk assessment (deterministic and probabilistic) from consumption of teas. The results showed that exposure to PMG, GLU and AMPA caused by drinking tea beverages poses no significant risk to human health. Regarding analytical procedures, it is stated that LOQ for Gly and AMPA was 0.3 mg/kg (derived from calibration standards); however the lowest validated concentration was 1.0 mg/kg.
24	Yokoyama S. et al.	CA 5.9	2021	Transient glyphosate encephalopathy due to a suicide attempt.	Neuropsychopharmacology reports, (2021), Vol. 41, No. 3, pp. 444-447	The article has been classified as relevant by full text - Category B for the following reason: This is a case report of a man who developed a delayed encephalopathy characterized by confusion seizure activity and decreased perfusion of his left cerebral

						hemisphere on SPECT 3 days after a suicidal ingestion of formulated glyposate. On intial presentation the patient was asymptomatic, underwent gasric lavage, which is not indicated in an asymptomatic patient, and was admitted to the psychiatric floor. 3 days later he as noted to have a delirium for which he was treated with mirtazipine. This was discontinued when symptoms grew progessively worse. The authors speculate that the cause of the encephalopathy was glyphosate. This is highly unlikely as glyphosate is not neurotoxic, nor does it cause vascular constriction. A unilateral perfusion deficit is very uncommon in a toxin induced encephalopathy. This case is much more consistent with acute alcohol withdrawal, which is a slow onset syndrome that takes 2-3 days to develop, is charcterized by delirium and seizures, reversible vasogenic edema in the hippocampal regions. This presentation is not consistent with glyphosate overdoses and because of the suicidal ingestion should not impact regulatory decisions.
25	Zhang C. Q. et al.	CA 5.9	2021	A case of allergic cutaneous vasculitis caused by glyphosate.	Chinese journal of industrial hygiene and occupational diseases, (2021), Vol. 39, No. 6, pp. 467-468	The article has been classified as relevant by full text - Category B for the following reason: This is a case report of a man who developed purpuric skin lesions involving the palms and leukocytoclastic vasculitis after exposure to an agrichemical that was reported to be glyphosate. His symptoms improved with steroid therapy, recurred upon reexposure 2 times and resolved with steoid treatment. The article claims that the chemistry involved was glyphosate despite the fact that there was no confirmation of exposure through any definitive identification of the product, urine or blood testing for the presence of glyphosate. Glyphosate is not a sensitizer, nor does it cause immune complex deposition in the vasculature. While the patient was worked up for several diseases associated leukocytoclastic vasculitis, they left out several very prominent infectious etiologies that are much more commonly associated with palmar rashes and vasculitidies. There is no described mechanism in the literature for this constellation of symptoms and no confirmation that the patient was exposed to glyphosate.

Table 36: Articles of unclear relevance (category C) after detailed assessment: sorted by data requirement(s)

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
43	CA 5.6	Kafshgiri Kaboli S. et al.	2021	Glyphosate effects on the female reproductive systems: a systematic review.	Reviews on environmental health, (2021): Ahead of print	The relevance of this article is unclear (Category C) for the following reason: The paper is a review of the literature that provides information on the effect of glyphosate formulations on the female reproductive system. The review does not provide all the necessary information, especially on the test material used, but refers to the original studies / there are no information on the formulation used and if they are similar to the representative formulation in EU / formulation accepted in EU.
44	CA 5.8	Maddalon A. et al.	2021	Glyphosate-based herbicides: Evidence of immune-endocrine alteration.	Toxicology, (2021), Vol. 459, Article No. 152851	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of published epidemiological studies and studies performed in vitro and in vivo in animals, the possible association between glyphosate based herbicides and immune-endocrine alterations. Overall, the authors could not conclude on the immune-endocrine alteration reported in the analysed publications and stated that further studies are required. No information was provided on the criteria used to select the publications and to conclude on their reliability. Most of the experiments were performed with glyphosate formulations and only few of them with pure glyphosate. However, the details on the test items used are not available for all the studies included in this review - some trade names are provided but not for all the studies. Moreover, the co-formulant POEA, is mentioned and likely to be included in some of the formulations. Lack of criteria in the selection of the reviewed publications and/or the high heterogeneity in the reported results and/or no firm conclusion on whether the observed effects could be unequivocally associated to exposure to glyphosate and/or glyphosate herbicides.
45	CA 5.8	Milesi M. M. et al.	2021	Glyphosate Herbicide: Reproductive Outcomes and Multigenerational Effects.	Frontiers in endocrinology, (2021), Vol. 12, Article No. 672532	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of the literature that provides information on the effects of glyphosate and glyphosate based formulations on reproductive health and endocrine functions. Overall, there is an absence of criteria for selecting the publications and their relevance/acceptability. Analyses of the selected publications highlighted the importance and need of further evaluating the toxicology of glyphosate and its formulations to the reproductive performance. Most of the experiments were performed with glyphosate formulations and only few of them with pure glyphosate. However, the details on the test items used are not available for all the studies included in this review - some trade names are provided but not for all the studies. Moreover, the co-formulant POEA, is mentioned and likely to be included in some of the formulations. Lack of criteria in the selection of the reviewed publications and/or the high heterogeneity in the reported results and/or no firm conclusion on whether the observed effects could be unequivocally associated to exposure to glyphosate and/or glyphosate herbicides.

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
46	CA 5.8	Mohammadi K. et al.	2021	A systematic review and meta-analysis of the impacts of glyphosate on the reproductive hormones.	Environmental science and pollution research international, (2021) doi: 10.1007/s11356-021-16145-x	The relevance of this article is unclear (Category C) for the following reason: The paper is a review of the literature and meta-analysis that provides information on the effect of glyphosate on the reproductive hormones. Among the initial 279 records identified, 54 articles were retrieved for full-text evaluation, and then only eight studies were eligible for this systematic review and meta-analysis. There are some experiences performed with pure glyphosate, however the details on the test items used are not available for all the studies included in this review. Overall, the outcome of this review based on the qualified studies could suggest a possible effect of glyphosate and/or glyphosate based herbicides on the health reproductive system due to a tendency in decreasing testosterone and follicle-stimulating hormone (FLH). However, as indicated by the authors this review may be affected by a series of limitations among which the high heterogeneity within the hormonal measurements and the small sample size of the final eligible studies for this review. Lack of criteria in the selection of the reviewed publications and/or the high heterogeneity in the reported results and/or no firm conclusion on whether the observed effects could be unequivocally associated to exposure to glyphosate and/or glyphosate herbicides.
47	CA 5.8	Rossetti M. F. et al.	2021	Epigenetic Changes Associated With Exposure to Glyphosate-Based Herbicides in Mammals.	Frontiers in endocrinology, (2021), Vol. 12, Article No. 671991	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of the literature that provides information on epigenetic changes associated with exposure to glyphosate and glyphosate formulations. However, the details on the test items used are not available for all the studies included in this review.
48	CA 5.8	Weisenburger D. D. et al.	2021	A Review and Update with Perspective of Evidence that the Herbicide Glyphosate (Roundup) is a Cause of Non-Hodgkin Lymphoma.	Clinical lymphoma, myeloma & leukemia, (2021), Vol. 21, No. 9, pp. 621-630	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of the literature that provides information on exposure to glyphosate formulations and non-hodgkin lymphoma. However, the details on the formulation used are not available for all the studies included in this review.
49	CA 8.2.5, CP 10.2.2	Song Y. et al.	2020	protective effects of melatonin on survival, immune response, digestive enzymes activities and intestinal microbiota diversity in Chinese mitten crab (Eriocheir sinensis) exposed to glyphosate	Comparative biochemistry and physiology: CBP (2020), Vol. 238, Article No. 108845	The relevance of this article is unclear (Category C) for the following reason: The only information from this study that is relevant for the risk assessment is the effect of glyphosate on survival rate. The rest of the investigated parameters are all based on findings at cellular/mollecular level and therefore not relevant. Glyphosate has been tested at only one concentration (48.945 mg/L) and this concentrations was calculated as the 96 h LC50 value in a previous study. Mortality in this study at that concentration is lower than 50%, but still the relevance of the findings of this study for the risk assessment is not clear. In addition, the test item was not identified (not clear whether it is active substance or a product -and which kind of formulation.)
50	CA 8.4.1, CP 10.4.1	Zaller J. G. et al.	2021	Effects of glyphosate-based herbicides and their active ingredients on earthworms, water infiltration and glyphosate leaching are influenced by soil properties	Environmental Sciences Europe, (2021) Vol. 33, No. 1, Article No. 51	The relevance of this article is unclear (Category C) for the following reason: This is a greenhouse experiment where established weed populations of common amaranth (Amaranthus retroflexus) were sprayed with three glyphosate-based herbicides GBHs (Roundup LB Plus, Roundup PowerFlex, Touchdown Quattro) and their corresponding AIs (salts of glyphosate isopropylammonium, potassium, diammonium) to examine their effects on the activity and physiological biomarkers of the earthworm species Lumbriculus terrestris. The route of exposure

Submission Number	Data requirement (indicated by the corresponding CA / CP data point number)	Author(s)	Year	Title	Source	Justification
						to earthworms (herbicides were sprayed to the plants and not to the soil) is not in line with the EU process and therefore, no relatable endpoint can be established as not direct effects were assessed. Moreover, some of the studied variables are based on a cellular or molecular level and the only information that could be integrated in the EU evaluation is related to the variation in the density and activity of the earthworms 4 weeks after weed control applications. In addition, final conclusions were expressed in terms of GBH or AI and not for every single treatment. Nevertheless, weeds were treated at recommended dosages just as they would be applied to kill weeds before sowing, so the study somehow mimics what really happens to earthworms living in the soil when exposed to glyphosate residues after the weeds in a field are treated before sowing the crop. The soil is natural and glyphosate concentrations in soil and leachate were measured, so the real exposure to earthworms 26 days after GBH/AI applications is known.

Table 37: Articles of unclear relevance (category C) after detailed assessment: sorted by author(s)

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
43	Kafshgiri Kaboli S. et al.	CA 5.6	2021	Glyphosate effects on the female reproductive systems: a systematic review.	Reviews on environmental health, (2021): Ahead of print	The relevance of this article is unclear (Category C) for the following reason: The paper is a review of the literature that provides information on the effect of glyphosate formulations on the female reproductive system. The review does not provide all the necessary information, especially on the test material used, but refers to the original studies / there are no information on the formulation used and if they are similar to the representative formulation in EU / formulation accepted in EU.
44	Maddalon A. et al.	CA 5.8	2021	Glyphosate-based herbicides: Evidence of immune-endocrine alteration.	Toxicology, (2021), Vol. 459, Article No. 152851	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of published epidemiological studies and studies performed in vitro and in vivo in animals, the possible association between glyphosate based herbicides and immune-endocrine alterations. Overall, the authors could not conclude on the immune-endocrine alteration reported in the analysed publications and stated that further studies are required. No information was provided on the criteria used to select the publications and to conclude on their reliability. Most of the experiments were performed with glyphosate formulations and only few of them with pure glyphosate. However, the details on the test items used are not available for all the studies included in this review - some trade names are provided but not for all the studies. Moreover, the co-formulant POEA, is mentioned and likely to be included in some of the formulations. Lack of criteria in the selection of the reviewed publications and/or the high heterogeneity in the reported results and/or no firm conclusion on whether the observed effects could be unequivocally associated to exposure to glyphosate and/or glyphosate herbicides.
45	Milesi M. M. et al.	CA 5.8	2021	Glyphosate Herbicide: Reproductive Outcomes and Multigenerational Effects.	Frontiers in endocrinology, (2021), Vol. 12, Article No. 672532	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of the literature that provides information on the effects of glyphosate and glyphosate based formulations on reproductive health and endocrine functions. Overall, there is an absence of criteria for selecting the publications and their relevance/acceptability. Analyses of the selected publications highlighted the importance and need of further evaluating the toxicology of glyphosate and its formulations to the reproductive performance. Most of the experiments were performed with glyphosate formulations and only few of them with pure glyphosate. However, the details on the test items used are not available for all the studies included in this review - some trade names are provided but not for all the studies. Moreover, the co-formulant POEA, is mentioned and likely to be included in some of the formulations. Lack of criteria in the selection of the reviewed publications and/or the high heterogeneity in the reported results and/or no firm conclusion on whether the observed effects could be unequivocally associated to exposure to glyphosate and/or glyphosate herbicides.

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
46	Mohammadi K. et al.	CA 5.8	2021	A systematic review and meta-analysis of the impacts of glyphosate on the reproductive hormones.	Environmental science and pollution research international, (2021) doi: 10.1007/s11356-021-16145-x	The relevance of this article is unclear (Category C) for the following reason: The paper is a review of the literature and meta-analysis that provides information on the effect of glyphosate on the reproductive hormones. Among the initial 279 records identified, 54 articles were retrieved for full-text evaluation, and then only eight studies were eligible for this systematic review and meta-analysis. There are some experiences performed with pure glyphosate, however the details on the test items used are not available for all the studies included in this review. Overall, the outcome of this review based on the qualified studies could suggest a possible effect of glyphosate and/or glyphosate based herbicides on the health reproductive system due to a tendency in decreasing testosterone and follicle-stimulating hormone (FLH). However, as indicated by the authors this review may be affected by a series of limitations among which the high heterogeneity within the hormonal measurements and the small sample size of the final eligible studies for this review. Lack of criteria in the selection of the reviewed publications and/or the high heterogeneity in the reported results and/or no firm conclusion on whether the observed effects could be unequivocally associated to exposure to glyphosate and/or glyphosate herbicides.
47	Rossetti M. F. et al.	CA 5.8	2021	Epigenetic Changes Associated With Exposure to Glyphosate-Based Herbicides in Mammals.	Frontiers in endocrinology, (2021), Vol. 12, Article No. 671991	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of the literature that provides information on epigenetic changes associated with exposure to glyphosate and glyphosate formulations. However, the details on the test items used are not available for all the studies included in this review.
49	Song Y. et al.	CA 8.2.5, CP 10.2.2	2020	protective effects of melatonin on survival, immune response, digestive enzymes activities and intestinal microbiota diversity in Chinese mitten crab (Eriocheir sinensis) exposed to glyphosate	Comparative biochemistry and physiology: CBP (2020), Vol. 238, Article No. 108845	The relevance of this article is unclear (Category C) for the following reason: The only information from this study that is relevant for the risk assessment is the effect of glyphosate on survival rate. The rest of the investigated parameters are all based on findings at cellular/mollecular level and therefore not relevant. Glyphosate has been tested at only one concentration (48.945 mg/L) and this concentrations was calculated as the 96 h LC50 value in a previous study. Mortality in this study at that concentration is lower than 50%, but still the relevance of the findings of this study for the risk assessment is not clear. In addition, the test item was not identified (not clear whether it is active substance or a product -and which kind of formulation.)
48	Weisenburger D. D. et al.	CA 5.8	2021	A Review and Update with Perspective of Evidence that the Herbicide Glyphosate (Roundup) is a Cause of Non-Hodgkin Lymphoma.	Clinical lymphoma, myeloma & leukemia, (2021), Vol. 21, No. 9, pp. 621-630	The relevance of this article is unclear (Category C) for the following reason: This paper is a review of the literature that provides information on exposure to glyphosate formulations and non-hodgkin lymphoma. However, the details on the formulation used are not available for all the studies included in this review.
50	Zaller J. G. et al.	CA 8.4.1, CP 10.4.1	2021	Effects of glyphosate-based herbicides and their active ingredients on earthworms, water infiltration and	Environmental Sciences Europe, (2021) Vol. 33, No. 1, Article No. 51	The relevance of this article is unclear (Category C) for the following reason: This is a greenhouse experiment where established weed populations of common amaranth (Amaranthus retroflexus) were sprayed with three glyphosate-based herbicides GBHs (Roundup LB Plus, Roundup PowerFlex, Touchdown Quattro) and their corresponding AIs (salts of glyphosate isopropylammonium, potassium, diammonium) to examine their effects on the activity and physiological

Submission Number	Author(s)	Data requirement (indicated by the corresponding CA / CP data point number)	Year	Title	Source	Justification
				glyphosate leaching are influenced by soil properties		biomarkers of the earthworm species Lumbriculus terrestris. The route of exposure to earthworms (herbicides were sprayed to the plants and not to the soil) is not in line with the EU process and therefore, no relatable endpoint can be established as not direct effects were assessed. Moreover, some of the studied variables are based on a cellular or molecular level and the only information that could be integrated in the EU evaluation is related to the variation in the density and activity of the earthworms 4 weeks after weed control applications. In addition, final conclusions were expressed in terms of GBH or AI and not for every single treatment. Nevertheless, weeds were treated at recommended dosages just as they would be applied to kill weeds before sowing, so the study somehow mimics what really happens to earthworms living in the soil when exposed to glyphosate residues after the weeds in a field are treated before sowing the crop. The soil is natural and glyphosate concentrations in soil and leachate were measured, so the real exposure to earthworms 26 days after GBH/AI applications is known.

Table 38: Articles excluded after detailed assessment (i.e. not relevant): sorted by technical section (and by author)

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
51	Ecotoxicology	Abdelmagid A. D. et al.	2021	Evaluation of Foeniculum vulgare impact on glyphosate hepato-toxicity in Nile tilapia: Biochemical, molecular and histopathological study	Aquaculture Research, (2021): Ahead of Print	The article has been classified as not relevant by full text for the following reason: The findings of this study are only based on cellular and molecular level that cannot be related to the risk assessment. The materials and methods section refers to an ecotoxicological LC50 endpoint, for which no information is provided.
52	Ecotoxicology	Banjare P. et al.	2021	Predictive classification-based QSTR models for toxicity study of diverse pesticides on multiple avian species	Environmental Science and Pollution Research, (2021), Vol. 28, No. 14, pp. 17992-18003	The article has been classified as not relevant by full text for the following reason: This article deals with general pesticide QSAR/QSTR effects models (not glyphosate specific) for birds, where glyphosate or a relevant metabolite are not the focus of the publication.
53	Ecotoxicology	Barbosa da Costa N. et al.	2021	Resistance, resilience, and functional redundancy of freshwater bacterioplankton communities facing a gradient of agricultural stressors in a mesocosm experiment.	Molecular ecology, (2021), Vol. 30, pp. 4771-4788	The article has been classified as not relevant by full text for the following reason: Roundup Super Concentrate contains POEA. This is clearly stated in the article by Muller et al. (2021): Toxicological Effects of Roundup(®) on Drosophila melanogaster Reproduction (Toxics 2021, 9, 161. https://doi.org/10.3390/toxics9070161). Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure, are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal.
54	Ecotoxicology	Fantón N. et al.	2021	Biomarkers of exposure and effect in the armoured catfish Hoplosternum littorale during a rice production cycle	Environmental pollution, (2021), Vol. 287, Article No. 117356	The article has been classified as not relevant by full text for the following reason: This higher tier field study under the realistic conditions that the armoured catfish Hoplosternum littorale is exposed to a variety of pesticides during a rice production cycle is conducted in a rice field in Argentina. Therefore, this publication is considered not relevant because it does not deal with EU representative conditions. In addition, although metabolite AMPA bioaccumulation in fish liver and muscle was measured, the observed effects are caused by a mixture of compounds (mixture toxicity). No control group was used.
55	Ecotoxicology	Gao X. et al.	2021	Glyphosate exposure disturbs the bacterial endosymbiont community and reduces body weight of the predatory ladybird beetle Harmonia axyridis (Coleoptera: Coccinellidae).	The Science of the total environment, (2021), Vol. 790, Article No. 147847	The article has been classified as not relevant by full text for the following reason: The findings of this study do not generate endpoints that are relatable to the EU level risk assessment. Larvae of the non-target leaf-dwelling predatory ladybird beetle Harmonia axyridis were orally exposed to two different glyphosate concentration in sucrose solution. NTA oral exposure in the lab cannot be integrated into the EU RA scheme. Furthermore, some findings are based on cellular and molecular level that cannot be related to the risk assessment.

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
56	Ecotoxicology	Hébert M-P. et al.	2021	Widespread agrochemicals differentially affect zooplankton biomass and community structure.	Ecological applications : a publication of the Ecological Society of America, (2021), Article No. e02423	The article has been classified as not relevant by full text for the following reason: Roundup Super Concentrate contains POEA. This is clearly stated in the article by Muller et al. (2021): Toxicological Effects of Roundup(®) on Drosophila melanogaster Reproduction (Toxics 2021, 9, 161. https://doi.org/10.3390/toxics9070161). Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure, are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal.
57	Ecotoxicology	Korkmaz V. et al.	2021	The bioremediation of glyphosate in soil media by some newly isolated bacteria: The COD, TOC removal efficiency and mortality assessment for Daphnia magna	Environmental technology & innovation, (2021), Vol. 22, Article No. 101535	The article has been classified as not relevant by full text for the following reason: The study design and the test system are not relevant for the European regulatory purposes. Daphnia magna was exposed to filtrated water taken from soil previously treated with a single concentration of 1000 mg glyphosate/L (not clear whether sprayed onto or mixed in). It is not possible to know which is the real concentration at which D. magna was exposed. In addition, the test item was not identified.
58	Ecotoxicology	Macri I. N. et al.	2021	Evaluating the impact of post-emergence weed control in honeybee colonies located in different agricultural surroundings.	Insects, (2021), Vol. 12, No. 2	The article has been classified as not relevant by full text for the following reason: The publication is dealing with genetically modified crops, which is not relevant for the glyphosate EU renewal. In addition, the experiment was performed with a mixture of 3 commercially formulated herbicides: an atrazine-based herbicide (Gesaprim® Syngenta), a 2,4-D-based herbicide (Voleris® Syngenta) and a glyphosate-based herbicide (Sulfosato Touchdown® Syngenta), thus the effect cannot be attributable to the substance of concern and can be seen as a consequence of the mixture toxicity. Based on the information in the safety data sheet provided on Syngenta's webpage (https://www.syngenta.com.ar/product/crop-protection/herbicida-no-selectivo/sulfosato-touchdown), Sulfosato Touchdown formulation contains polyethoxylated tallow amine (POEA). Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure, are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example,

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal. Finally, the study was conducted under field conditions in Argentina and therefore, not representative for the EU conditions.
59	Ecotoxicology	Muller K. et al.	2021	Toxicological Effects of Roundup(®) on Drosophila melanogaster Reproduction.	Toxics, (2021), Vol. 9, No. 7	The article has been classified as not relevant by full text for the following reason: None of the formulations tested is the representative formulation for the EU glyphosate renewal. Roundup® Ready to Use is a mixture of pelargonic acid and glyphosate thus the effects observed cannot be attributable to glyphosate only and can be seen as a consequence of the mixture toxicity. Roundup® Super Concentrate contains POEA. Glyphosate based formulations that contain POEA (polyethoxylated tallow amine) surfactants or surfactants of similar chemical structure, are generally more toxic than the active substance itself. In addition, the composition of formulations is an important consideration when comparing the endpoints achieved in public literature with those achieved in regulatory studies conducted with either the technical material or studies conducted with the representative formulation MON 52276. Co-formulants may ameliorate or enhance potential effects on test organisms. For example, POEA based surfactants (not permitted for use in Europe) or surfactants with similar structure, may lead to enhanced sensitivity. For this reason, the findings in the paper cannot be related to the representative formulation, and are therefore not relevant to the regulatory risk assessment for the glyphosate EU renewal.
60	Ecotoxicology	Sudmoon R. et al.	2021	The effect of glyphosate on genotoxicity in Ipomoea aquatica	Toxicological & Environmental Chemistry, (2021) : Ahead of Print.	The article has been classified as not relevant by full text for the following reason: This study investigates the effects of glyphosate on growth rate and genotoxicity of Ipomoea aquatica. The plants were grown in a soil collected from an organic agricultural field in Thailand which was supplemented with glyphosate at 1- to 3-fold the recommended dose. After 30 days, lengths and dry weights of the roots and shoots were found to decrease in a concentration dependent manner. The study aimed to simulate field conditions and the plants were grown in the open field with added organic fertilizers. Therefore, the publication is not dealing with EU representative uses / conditions (e.g. field locations, soil properties, non-EU monitoring etc.) and it is not relevant for the risk assessment. In addition, the concentration of glyphosate in the soil was not analyzed.
61	Ecotoxicology	Torres-Badia M. et al.	2021	Impaired mammalian sperm function and lower phosphorylation signaling caused by the herbicide Roundup® Ultra Plus are due to its surfactant component.	Theriogenology, (2021), Vol. 172, pp. 55-66	The article has been classified as not relevant by full text for the following reason: Pig spermatozoa were incubated in Tyrode's basal medium (TBM) or Tyrode's complete medium (TCM) (1 h at 38.5 C) with several Roundup dilutions or equivalent concentrations of glyphosate or POEA. The study design, the test system and mostly the exposure route are not relevant for the European regulatory purposes regarding ecotoxicology. In addition, most of the findings are based on

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						cellular and molecular level that cannot be related to the risk assessment. In addition, the formulation tested contains POEA (See Materials and Methods - The commercially available Roundup® Ultra Plus contains 36% (w/v) of the active ingredient glyphosate (GLY) and 6% (w/v) of the surfactant, polyoxyethylene amine (POEA).
62	Ecotoxicology	Torres-Moya F. et al.	2020	Study of the effects of glyphosate application on Collembola populations under controlled conditions.	Agronomia Colombiana, (2020), Vol. 38, No. 3, pp. 398-405	The article has been classified as not relevant by full text for the following reason: The objective of this research was to determine the effect of the application of different glyphosate doses on variation in collembolan (springtail) populations, but he study design, the test system and the mode of exposure of this study are not relevant for the European regulatory purposes. In addition, the publication does not deal with EU representative conditions (e.g. soil properties, non-EU monitoring of populations) because part of the soil used for the tests as well as all tested individuals were taken from a field location in Colombia.
63	Ecotoxicology	Wided O. et al.	2021	Protective role of Spirulina platensis against glyphosate induced toxicity in marine mussel Mytilus galloprovincialis	Journal of Environmental Science and Health, Part C: Toxicology and Carcinogenesis, (2021): Ahead of Print	The article has been classified as not relevant by full text for the following reason: The findings of this study are only based on cellular and molecular level that cannot be related to the risk assessment.
64	Ecotoxicology	Yang C. et al.	2021	Reproductive toxicity due to herbicide exposure in freshwater organisms.	Comparative biochemistry and physiology. Toxicology & pharmacology, (2021), Vol. 248, Article No. 109103	The article has been classified as not relevant by full text for the following reason: This review article presents only secondary information dealing with general herbicide exposures (not glyphosate specific), where no new data is provided that can be used for risk assessment.
65	Ecotoxicology	Zheng T. et al.	2022	Alleviative effects of Ginkgo biloba extract on oxidative stress, inflammatory response and immune suppression induced by long-term glyphosate exposure in tilapia (Oreochromis niloticus)	Aquaculture, (2022), Vol. 546, Article No. 737325	The article has been classified as not relevant by full text for the following reason: The findings of this study are only based on cellular and molecular level that cannot be related to the risk assessment.
66	Fate and behaviour in the environment	Barrow N. J.	2021	Some comments on: Phosphate and glyphosate sorption in soils following long-term phosphate applications by Munira et al. (2018)	Geoderma, (2021), Vol. 402, Article No. 115334	The article has been classified as not relevant by full text for the following reason: Ther article is commenting on another article (Phosphate and glyphosate sorption in soils following long-term phosphate applications by Munira et al. (2018)). The comment is related to the influence of phosphate on the adsorption of glyphosate. Another equation for calculating the Kf value in the presence of phosphate is proposed. There is no impact on the results for non-phosphate-amended soil. Furthermore the comment does not give any results but only further recommendations for data evaluation and interpretation.
67	Fate and behaviour in the environment	Sadatsharifi M. et al.	2021	The fate of a hazardous herbicide: a DFT-based ab initio study on glyphosate degradation.	Environmental science. Processes & impacts, (2021), Vol. 23, No. 7, pp. 1018-1028	The article has been classified as not relevant by full text for the following reason: Calculations were performed using density functional theory and post-Hartree-Fock correlated ab initio methods to find the possible mechanisms for the degradation process by small (hydroxyl, peroxyl, and superoxide) radicals. Rate constants (s -1) were calculated from the ab initio results for different elementary steps (transition steps for the reaction of glyphosate anions and radicals). No endpoints for EU risk assessment are generated. Quantum chemical calculations were

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						applied to determined structures and energies of molecular forms (isomers, intermediates, transition states) of glyphosate.
68	Fate and behaviour in the environment	Voutchkova D. D. et al.	2021	Estimating pesticides in public drinking water at the household level in Denmark	GEUS BULLETIN, (2021), Vol. 47, DOI:10.34194/geusb.v47.6090	The article has been classified as not relevant by full text for the following reason: Data on pesticide residues in Danish drinking water was taken from the national database Jupiter (https://eng.geus.dk/products-services-facilities/data-andmaps/national-well-database-jupiter). The highest amount detected was 3.2 µg/L for glyphosate and 1.2 µg/L for AMPA (see supplemental material). No information on location and timing of the detection are reported.The article contains secondary information and does not generate new data. Jupiter database was covered by applicant's evaluation on public monitoring data.
69	Toxicology and metabolism	Barbosa A. et al.	2021	Study of muscle fibers of the extensor digitorium longus and soleus muscles of C57BL/6 females exposed to glyphosate during pregnancy and lactation.	Einstein (Sao Paulo, Brazil), (2021), Vol. 19, Article No. eAO5657	The article has been classified as not relevant by full text for the following reason: The aim of this study was to evaluate the morphology and morphometry of the muscles extensor digitorium longus and soleus of C57BL/6 females, who were exposed to glyphosate during pregnancy and lactation. Glyphosate group presented lower weight gain during pregnancy and also lower final body weight and naso-anal length; however, the other body parameters evaluated did not present a significant difference in relation to the Control Group. Significant differences were also not observed in the analysis of muscle fibers and connective tissue. Importantly, although weight gain was measured, there were not records of feed intake for each group, which is most likely the main determinant in ascribing cause for the weight differences reported. The publication is dealing with a glyphosate formulation Roundup Original containing POEA. The representative formulation for the glyphosate AIR5 does not contain POEA. POEA is banned in the EU. Thus the paper is not relevant to the EU glyphosate renewal.
70	Toxicology and metabolism	de Maria Serra F. et al.	2021	Subchronic exposure to a glyphosate-based herbicide causes dysplasia in the digestive tract of Wistar rats.	Environmental science and pollution research international, (2021), Vol. 28, pp. 61477-61496	The article has been classified as not relevant by full text for the following reason: The publication is dealing with a glyphosate formulation Roundup Original containing POEA. The representative formulation for the glyphosate AIR5 does not contain POEA. POEA is banned in the EU. Thus the paper is not relevant to the EU glyphosate renewal.
71	Toxicology and metabolism	Giambo F. et al.	2021	Toxicology and Microbiota: How Do Pesticides Influence Gut Microbiota? A Review	INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH, (2021), Vol. 18, No. 11	The article has been classified as not relevant by full text for the following reason: This paper is a review of the literature on the influence of pesticide exposure on gut microbial. Glyphosate is mentioned in only one paragraph of the article and no information is available on the test item, the experimental conditions and the description of the results.
72	Toxicology and metabolism	Kogevinas M.	2021	Glyphosate Exposure during Pregnancy and Preterm Birth (More Research Is Needed).	Environmental health perspectives, (2021), Vol. 129, No. 5, Article No. 51301	The article has been classified as not relevant by full text for the following reason: This is a commentary on a single published article, not original research. There is no study design or study population per se. There is no information in this commentary to evaluate the appropriateness of a study population. The conclusion of the author is that more research is needed. As such, the commentary does not

Submission Number	Technical section	Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance criteria)
						contribute relevant / reliable information to the assessment of risk from glyphosate use.
73	Toxicology and metabolism	Mesnage R. et al.	2020	Computational modelling provides insight into the effects of glyphosate on the shikimate pathway in the human gut microbiome.	Current research in toxicology, (2020), Vol. 1, pp. 25-33	The article has been classified as not relevant by full text for the following reason: The publication studies the presence and activity of the shikimate pathway by assessing faecal metagenomes from different datasets. There is also the reference to a previous microbiome study to understand the effects of glyphosate/glyphosate formulated product on the gut microbiota at different stages of the rat digestive tract. However, the main part of the article is focussing on the metagenomes and metatranscriptomes and not evaluating the effect on gut microbiota after exposure to glyphosate. Moreover, potential effects to gut microbiota and serum metabolome are not part of the EU risk assessments.

Appendix 1: AGG ADVICE on how to present the literature search in the dossier

ASSESSMENT GROUP ON GLYPHOSATE (AGG)

October 2019

ADVICE TO GTF2:
HOW TO PRESENT THE LITERATURE SEARCH
IN THE DOSSIER TO BE SUBMITTED JUNE 2020

The literature search should be carried out and presented as recommended in the EFSA Guidance EFSA Journal 2011;9(2):2092) including its recently published Appendix, available at the EFSA Journal.

Rapid assessment of titles/abstracts: Articles that are considered as **not relevant**:

Not necessary to submit articles or study summaries but justification needed at a general level, i.e. criteria used to classify references as being clearly non-relevant.

Detailed assessment of full text of articles: Articles that are considered as **not relevant** **or** considered **not reliable**:

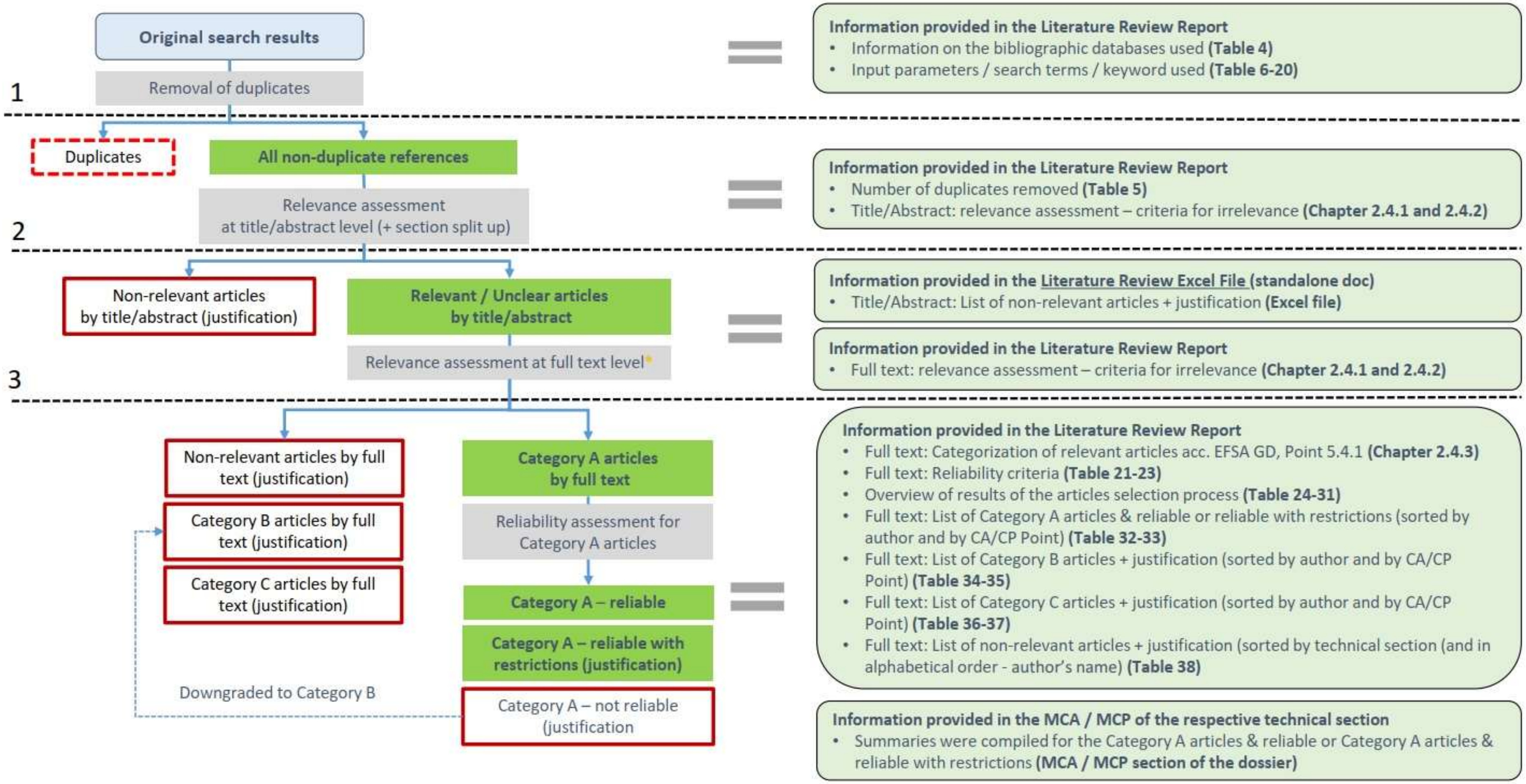
Necessary to submit articles and statement with the reason of rejection (no study summaries).

Detailed assessment of full text of articles: Articles considered as **relevant and reliable**:

Necessary to submit articles. A detailed study summary should be provided in the relevant section of Doc MCA/MCP.

For presentation of detailed study summary, reference is made to EFSA Administrative guidance on submission of dossiers and assessment reports for the peer-review of pesticide active substances (27 March 2019, doi: 10.2903/sp.efsa.2016.EN-1612).

Appendix 2: The process of articles selection



* All articles (and their translations) evaluated at full-text level (detailed assessment) are submitted to the AGG.

Appendix 3: ORIGINAL SEARCH QUERY – 14 May 2021 – August 2021

Preparing the search queries on STN:

```
    FILE 'STNGUIDE' ENTERED AT 10:45:08 ON 08 SEP 2021
CHARGED TO COST=113898
L1         QUE SPE=ON  ABB=ON  PLU=ON  GLYPHOSAT? OR GLIFOSAT? OR
           GLYFOSAT? OR 1071-83-6 OR 38641-94-0 OR 70901-12-1 OR 39600-42-
           5 OR 69200-57-3 OR 34494-04-7 OR 114370-14-8 OR 40465-66-5 OR
           69254-40-6 OR AMINOMETHYL PHOSPHONIC OR AMINOMETHYLPHOSPHONIC
           OR 1066-51-9
           SAVE TEMP L1 GLY1/Q

L2         QUE SPE=ON  ABB=ON  PLU=ON  2 ACETYL PHOSPHONOMETHYL AMINO
           ACETIC ACID OR N ACETYL GLYPHOSATE OR N ACETYLGLYPHOSATE OR N
           ACETYL N PHOSPHONOMETHYL GLYCINE OR 129660-96-4 OR N ACETYL
           AMPA OR ACETYLAMINO METHYL PHOSPHONIC ACID OR ACETYLAMINOMETHYL
            PHOSPHONIC ACID OR 57637-97-5
           SAVE TEMP L2 GLY2/Q

L3         QUE SPE=ON  ABB=ON  PLU=ON  2617-47-2 OR HYDROXYMETHANEPHOSPHON
           IC ACID OR HYDROXYMETHYL PHOSPHONATE OR HYDROXYMETHYL PHOSPHONI
           C ACID OR METHANEHYDROXYPHOSPHONIC ACID OR PHOSPHONIC ACID(1W)H
           YDROXYMETHYL OR PHOSPHONOMETHANOL
L4         QUE SPE=ON  ABB=ON  PLU=ON  HYDROXYMETHYLPHOSPHONATE OR
           HYDROXYMETHYLPHOSPHONIC ACID
L5         QUE SPE=ON  ABB=ON  PLU=ON  L3 OR L4
           SAVE TEMP L5 GLY3/Q

L6         QUE SPE=ON  ABB=ON  PLU=ON  35404-71-8 OR METHYLAMINO METHYL
           PHOSPHONIC ACID OR METHYLAMINOMETHYL PHOSPHONIC ACID OR
           METHYLAMINOMETHYLPHOSPHONIC ACID OR N METHYL AMPA OR NSC
           244826 OR PHOSPHONIC ACID METHYLAMINO METHYL OR PHOSPHONIC
           ACID P METHYLAMINO METHYL
L7         QUE SPE=ON  ABB=ON  PLU=ON  2 3 DIHYDROXY 1 OXOPROPYL AMINOMETH
           YL PHOSPHONIC ACID OR 2 3 DIHYDROXY 1 OXOPROPYL AMINOMETHYLPHOS
           PHONIC ACID OR N GLYCERYL AMPA
L8         QUE SPE=ON  ABB=ON  PLU=ON  3 OXO 3 PHOSPHONOMETHYL AMINO
           PROPANOIC ACID OR 3 OXO 3 PHOSPHONOMETHYL AMINOPROPANOIC ACID
           OR N MALONYL AMPA
L9         QUE SPE=ON  ABB=ON  PLU=ON  993-13-5 OR DIHYDROGEN METHYLPHOSPH
           ONATE OR METHANEPHOSPHONIC ACID OR METHYL PHOSPHONIC ACID OR
           METHYLPHOSPHONIC ACID OR NSC 119358 OR PHOSPHONIC ACID METHYL
           OR PHOSPHONIC ACID P METHYL
L10        QUE SPE=ON  ABB=ON  PLU=ON  (L6 OR L7 OR L8 OR L9)
           SAVE TEMP L10 GLY4/Q

L11        QUE SPE=ON  ABB=ON  PLU=ON  24569-83-3 OR 2 METHYL PHOSPHONOMET
           HYL AMINO ACETIC ACID OR 2 METHYL PHOSPHONOMETHYL AMINOACETIC
           ACID OR ACETIC ACID 2 N METHYL N PHOSPHONATOMETHYL AMINO OR
           GLYCINE N METHYL N PHOSPHONOMETHYL OR GLYPHOSATE N METHYL OR
           METHYL GLYPHOSATE
L12        QUE SPE=ON  ABB=ON  PLU=ON  METHYL PHOSPHONOMETHYL AMINO
           ACETIC ACID OR METHYL PHOSPHONOMETHYL AMINOACETIC ACID OR N
           METHYL N PHOSPHONOMETHYL GLYCINE OR N METHYLGLYPHOSATE OR N
           PHOSPHONOMETHYL N METHYL GLYCINE OR N PHOSPHONOMETHYL N
           METHYLGLYCINE
L13        QUE SPE=ON  ABB=ON  PLU=ON  (L11 OR L12)
           SAVE TEMP L13 GLY5/Q

L14        QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR HAZARD? OR ADVERSE OR
           HEALTH OR NOAEL OR NOEL OR LOAEL OR LOEL OR BMD? OR IN VIVO OR
           IN VITRO OR INVIVO OR INVITRO OR MODE OF ACTION OR SKIN? OR
           EYE? OR IRRIT? OR SENSI? OR ALLERG?
L15        QUE SPE=ON  ABB=ON  PLU=ON  RAT OR RATS OR DOG? OR RABBIT? OR
           GUINEA PIG? OR MOUSE OR MICE OR METABOLISM OR METABOLITE? OR
           METABOLIC OR DISTRIBUTION OR ADSORPTION OR EXCRETION OR
           ELIMINATION OR KINETIC OR CYTOCHROME OR ENZYM?
L16        QUE SPE=ON  ABB=ON  PLU=ON  GEN? OR MUTA? OR CHROMOS? OR
           CLASTOGEN? OR DNA OR CARCINO? OR CANCER? OR TUMOR? OR TUMOUR?
           OR ONCOG? OR ONCOL? OR MALIGN? OR IMMUN? OR NEUR? OR ENDOCRIN?
           OR HORMON? OR GONAD? OR DISRUPT?
L17        QUE SPE=ON  ABB=ON  PLU=ON  REPRODUCT? OR DEVELOPMENT? OR
           MALFORM? OR ANOMAL? OR FERTIL? OR FOET? OR FET? OR MATERN? OR
           PREGNAN? OR EMBRYO? OR EPIDEM? OR MEDICAL? OR POISON? OR
           EXPOSURE OR OPERATOR? OR BYSTANDER? OR RESIDENT? OR WORKER? OR
           OCCUPAT?
L18        QUE SPE=ON  ABB=ON  PLU=ON  BIOMONITORING OR HUMAN EXPOSURE OR
           MICROBIOME OR OXIDATIVE STRESS OR APOPTOSIS OR NECROSIS OR
           CYTOTOXICITY OR POLYOXYETHYLENEAMINE OR POEA OR SURFACTANT OR
           RISK ASSESSMENT?
L19        QUE SPE=ON  ABB=ON  PLU=ON  (L14 OR L15 OR L16 OR L17 OR L18)
           SAVE TEMP L19 TOX/Q

L20        QUE SPE=ON  ABB=ON  PLU=ON  UPTAKE OR TRANSLOCATION OR RUMEN
           OR STORAGE STABILITY OR STORAGE OR STABILITY OR METABOLIC OR
           METABOLISM OR BREAKDOWN OR NATURE OF RESIDUES OR RESIDUE? OR
           MAGNITUDE OF RESIDUES OR PROCESS? OR EFFECTS OF PROCESSING
L21        QUE SPE=ON  ABB=ON  PLU=ON  DESSICANT OR PREHARVEST OR
           PREEMERG? OR ?RESISTANT? OR ?TOLERAN? OR TRANSGENIC OR
           HYDROLY? OR ROTATION? OR SUCCEED? OR PLANT? OR CROP? OR FEED?
           OR ANIMAL? OR LIVESTOCK? OR HEN OR CATTLE OR RUMINANT?
L22        QUE SPE=ON  ABB=ON  PLU=ON  GOAT? OR COW? OR PIG? OR DIETARY
           OR ASSESSMENT OR RISK ASSESSMENT OR CONSUM? OR EXPOSURE
L23        QUE SPE=ON  ABB=ON  PLU=ON  (L20 OR L21 OR L22)
           SAVE TEMP L23 RES/Q

L24        QUE SPE=ON  ABB=ON  PLU=ON  SOIL OR WATER OR SEDIMENT OR
           DEGRADAT? OR PHOTO? OR SOIL RESIDUES OR SOIL ACCUMULAT? OR
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          SOIL CONTAMINAT? OR MOBILITY OR SORPTION OR COLUMN LEACHING OR
          AGED RESIDUE OR LEACH? OR LYSIMETER OR GROUNDWATER
L25         QUE SPE=ON  ABB=ON  PLU=ON  CONTAMINAT? OR MICROB? OR EXUDATION
          OR RHIZOSPHERE OR DISSIPATION OR SATURATED ZONE OR HYDROLYSIS
          OR DRIFT OR RUN-OFF  OR RUNOFF OR DRAINAGE OR VOLAT? OR
          ATMOSPHERE OR LONG-RANGE TRANSPORT OR SHORT-RANGE TRANSPORT
L26         QUE SPE=ON  ABB=ON  PLU=ON  TRANSPORT OR MICRONUTRIENT OR
          PHOSPHATE OR IRON OR MANGANESE OR HALF-LIFE OR HALFLIFE OR
          HALF-LIVES OR HALFLIVES OR DT50 OR KINETICS OR OFF-SITE
          MOVEMENT OR REMOVAL OR DRINKING WATER OR WATER TREATMENT
          PROCESSES
L27         QUE SPE=ON  ABB=ON  PLU=ON  ATMOSPHERIC DEPOSITION OR TILE-DRAI
          NS OR SURFACE WATER OR MONITORING DATA OR DISINFECTANT OR
          OZONE OR TILLAGE OR INFILTRATION OR HARD SURFACE OR RAINWATER
          OR RAIN WATER OR CHELAT? OR COMPLEX? OR MINERALIZATION OR
          PERSISTENCE OR LIGAND
L28         QUE SPE=ON  ABB=ON  PLU=ON  (L24 OR L25 OR L26 OR L27)
          SAVE TEMP L28 FATE/Q
L29         QUE SPE=ON  ABB=ON  PLU=ON  TOX? OR ECOTOX? OR ?TOXIC OR
          ?TOXICITY OR HAZARD OR ADVERSE OR ENDOCRINE DISRUPT? OR
          BIOACCUMULATE? OR BIOMAGNIFI? OR BIOCONCENTRATION OR POISON OR
          EFFECT OR INDIRECT EFFECT? OR DIRECT EFFECT? OR BIODIVERS? OR
          PROTECTION GOALS OR ECO?
L30         QUE SPE=ON  ABB=ON  PLU=ON  IMPACT OR POPULATION OR COMMUNITY
          OR WILDLIFE OR INCIDENT OR PEST OR BIRD? OR ACUTE OR CHRONIC
          OR LONG-TERM OR MALLARD OR DUCK OR QUAIL OR BOBWHITE OR ANAS?
          OR COLINUS? OR WILD OR DIETARY OR AQUATIC OR FISH OR DAPHNI?
          OR ALG? OR CHIRON?
L31         QUE SPE=ON  ABB=ON  PLU=ON  SEDIMENT DWELL? OR BENTHIC OR
          LEMNA OR MARIN? OR ESTUARINE OR CRUSTA? OR GASTROPOD? OR
          INSECT OR MOLLUSC OR REPTILE OR AMPHIB? OR BEE? OR APIS OR
          APIDAE OR BUMBLE? OR COLONY OR HIVE OR POLLINATOR
L32         QUE SPE=ON  ABB=ON  PLU=ON  PLANT AND (SUBMERGE? OR EMERGE?)
L33         QUE SPE=ON  ABB=ON  PLU=ON  SOLITARY OR ALG? OR AQUATIC OR
          FRESHWATER OR VERTEBRAT? OR MAMMAL? OR RAT OR MOUSE OR MICE OR
          RABBIT OR HARE OR PROTECTION OR MODEL? OR VOLE OR PEST OR
          ARTHROPOD? OR BENEFICIALS OR TYPHLODROMUS OR APHIDIUS OR
          PARASITOID
L34         QUE SPE=ON  ABB=ON  PLU=ON  PREDATOR OR CHRYSOPERLA OR ORIUS
          OR SPIDER OR WORM? OR ?WORM OR EISENIA OR SOIL OR COLLEMBOL?
          OR MACRO ORGANISM OR FOLSOMIA OR SPRINGTAIL OR DECOMPOS? OR
          MICRO ORGANISMS OR MICROORGANISMS OR MICROBIAL OR CARBON OR
          NITROGEN
L35         QUE SPE=ON  ABB=ON  PLU=ON  PLANT? OR VEGETATIVE VIGO? OR
          SEEDLING OR GERMINATION OR MONOCOT? OR DICOT? OR SEWAGE OR
          ACTIVATED SLUDGE OR BIODEGRAD? OR BIOACCUMULATION? OR AMPHIB?
          OR REPTILE? OR AQUATIC PLANT OR BENEFICIAL
L36         QUE SPE=ON  ABB=ON  PLU=ON  (L29 OR L30 OR L31 OR L32 OR L33
          OR L34 OR L35)
          SAVE TEMP L36 ECO/Q


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Final search - Update Sep 2021:
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   FILE 'MEDLINE' ENTERED AT 10:52:47 ON 08 SEP 2021
CHARGED TO COST=113898
L1       4783 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L2        158 SEA SPE=ON  ABB=ON  PLU=ON  L1 AND ED>20210513
L3        158 SEA SPE=ON  ABB=ON  PLU=ON  L2 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
          SAVE TEMP L3 GLYMEDL/A

   FILE 'AGRICOLA' ENTERED AT 10:55:50 ON 08 SEP 2021
CHARGED TO COST=113898
L4       7886 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L5        287 SEA SPE=ON  ABB=ON  PLU=ON  L4 AND ED>20210513
L6        287 SEA SPE=ON  ABB=ON  PLU=ON  L5 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
          SAVE TEMP L6 GLYAGRI/A

   FILE 'BIOSIS' ENTERED AT 10:59:54 ON 08 SEP 2021
CHARGED TO COST=113898
L7      12042 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L8        257 SEA SPE=ON  ABB=ON  PLU=ON  L7 AND ED>20210513
L9        239 SEA SPE=ON  ABB=ON  PLU=ON  L8 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
          SAVE TEMP L9 GLYBIOS/A

   FILE 'CABA' ENTERED AT 11:02:35 ON 08 SEP 2021
CHARGED TO COST=113898
L10     19905 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L11       353 SEA SPE=ON  ABB=ON  PLU=ON  L10 AND ED>20210513
L12       353 SEA SPE=ON  ABB=ON  PLU=ON  L11 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
          SAVE TEMP L12 GLYCABA/A

   FILE 'FSTA' ENTERED AT 11:05:19 ON 08 SEP 2021
CHARGED TO COST=113898
L13       602 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
          GLY4/Q OR GLY5/Q
L14        21 SEA SPE=ON  ABB=ON  PLU=ON  L13 AND ED>20210513
L15        19 SEA SPE=ON  ABB=ON  PLU=ON  L14 NOT (COMMENT? OR DISSERTATION
          OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
          SAVE TEMP L15 GLYFSTA/A
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    FILE 'PQSCITECH' ENTERED AT 11:07:39 ON 08 SEP 2021
CHARGED TO COST=113898
L16       5751 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
                GLY4/Q OR GLY5/Q
L17        126 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND ED>20210513
L18        111 SEA SPE=ON  ABB=ON  PLU=ON  L17 NOT (COMMENT? OR DISSERTATION
                OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
                SAVE TEMP L18 GLYPQSCI/A

    FILE 'TOXCENTER' ENTERED AT 11:11:02 ON 08 SEP 2021
CHARGED TO COST=113898
L19      18156 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
                GLY4/Q OR GLY5/Q
L20        429 SEA SPE=ON  ABB=ON  PLU=ON  L19 AND ED>20210513
L21        353 SEA SPE=ON  ABB=ON  PLU=ON  L20 NOT (COMMENT? OR DISSERTATION
                OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
                SAVE TEMP L21 GLYTOXC/A

    FILE 'EMBASE' ENTERED AT 11:13:40 ON 08 SEP 2021
CHARGED TO COST=113898
L22       6368 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
                GLY4/Q OR GLY5/Q
L23        121 SEA SPE=ON  ABB=ON  PLU=ON  L22 AND ED>20210513
L24        120 SEA SPE=ON  ABB=ON  PLU=ON  L23 NOT (COMMENT? OR DISSERTATION
                OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
                SAVE TEMP L24 GLYEMBA/A

    FILE 'ESBIOBASE' ENTERED AT 11:16:19 ON 08 SEP 2021
CHARGED TO COST=113898
L25       5510 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
                GLY4/Q OR GLY5/Q
L26        129 SEA SPE=ON  ABB=ON  PLU=ON  L25 AND ED>20210513
L27        129 SEA SPE=ON  ABB=ON  PLU=ON  L26 NOT (COMMENT? OR DISSERTATION
                OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
                SAVE TEMP L27 GLYESBIO/A

    FILE 'HCAPLUS' ENTERED AT 11:18:54 ON 08 SEP 2021
CHARGED TO COST=113898
L28      31160 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
                GLY4/Q OR GLY5/Q
L29        440 SEA SPE=ON  ABB=ON  PLU=ON  L28 AND ED>20210513
L30        272 SEA SPE=ON  ABB=ON  PLU=ON  L29 NOT (COMMENT? OR DISSERTATION
                OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
                SAVE TEMP L30 GLYHCAP/A

    FILE 'SCISEARCH' ENTERED AT 11:20:57 ON 08 SEP 2021
CHARGED TO COST=113898
L31      13214 SEA SPE=ON  ABB=ON  PLU=ON  GLY1/Q OR GLY2/Q OR GLY3/Q OR
                GLY4/Q OR GLY5/Q
L32        390 SEA SPE=ON  ABB=ON  PLU=ON  L31 AND ED>20210513
L33        387 SEA SPE=ON  ABB=ON  PLU=ON  L32 NOT (COMMENT? OR DISSERTATION
                OR EDITORIAL OR MEETING? OR NEWS? OR PATENT OR PRESS RELEASE)/DT
                SAVE TEMP L33 GLYSCIS/A

    FILE 'HOME' ENTERED AT 11:23:03 ON 08 SEP 2021
CHARGED TO COST=113898

    FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
    EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 11:26:51 ON 08 SEP 2021
CHARGED TO COST=113898
L34       1443 DUP REM L3 L6 L9 L12 L15 L18 L21 L24 L27 L30 L33 (985 DUPLICATE
                   ANSWERS '1-158' FROM FILE MEDLINE
                   ANSWERS '159-436' FROM FILE AGRICOLA
                   ANSWERS '437-632' FROM FILE BIOSIS
                   ANSWERS '633-907' FROM FILE CABA
                   ANSWERS '908-919' FROM FILE FSTA
                   ANSWERS '920-999' FROM FILE PQSCITECH
                   ANSWERS '1000-1132' FROM FILE TOXCENTER
                   ANSWERS '1133-1170' FROM FILE EMBASE
                   ANSWERS '1171-1199' FROM FILE ESBIOBASE
                   ANSWERS '1200-1275' FROM FILE HCAPLUS
                   ANSWERS '1276-1443' FROM FILE SCISEARCH
                SAVE L34 GLY202109/A

L35       1162 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND TOX/Q
                SAVE TEMP L35 GLYTOX/A

L36       1285 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND RES/Q

L37        869 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND FATE/Q
                SAVE TEMP L37 GLYFATE/A

L38       1365 SEA SPE=ON  ABB=ON  PLU=ON  L34 AND ECO/Q
L39       1431 SEA SPE=ON  ABB=ON  PLU=ON  (L35 OR L36 OR L37 OR L38)
                SAVE L39 GLY202109FIN/A


    FILE 'MEDLINE, AGRICOLA, BIOSIS, CABA, FSTA, PQSCITECH, TOXCENTER,
    EMBASE, ESBIOBASE, HCAPLUS, SCISEARCH' ENTERED AT 12:56:47 ON 08 SEP 2021
CHARGED TO COST=113898
                D ALL 1-TOT


SESSION WILL BE HELD FOR 120 MINUTES
STN INTERNATIONAL SESSION SUSPENDED AT 14:10:05 ON 08 SEP 2021
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