公表文献に関する報告書

有効成分名：ヘキサコナゾール

シンジェンタジャパン株式会社

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農薬取締法に基づく農薬有効成分の再評価制度に係る公表文献調査報告書

有効成分名：ヘキサコナゾール

目次

1. 検索対象有効成分

一般名　：ヘキサコナゾール、Hexaconazole

IUPAC 名：(*RS*)-2-(2,4-ジクロロフェニル)-1-(1*H*-1,2,4-トリアゾール-1-イル)ヘキサン-2-オール
(*RS*)-2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2-ol

CAS 名　：α-ブチル-α-(2,4-ジクロロフェニル)-1*H*-1,2,4-トリアゾール-1-エタノール
α-butyl-α-(2,4-dichlorophenyl)-1*H*-1,2,4-triazole-1-ethanol

CAS 番号：79983-71-4

2. 検索条件

2.1. 文献検索に用いたプラットフォーム/データベース、検索日及び検索期間

文献検索に使用した検索プラットフォームは、英文キーワード検索については Web of Science Core Collection（WOSCC）と J-STAGE、和文キーワード検索については J-STAGE を用いた。

表 2－1－1　文献検索に用いたプラットフォーム/データベース(文献データベース)

分類	データベースの特徴	収載範囲 (文献検索時の文献数)	最新更新日 更新頻度	検索日	検索期間
Web of Science Core Collection (WOSCC)	科学技術、社会科学、人文科学における世界最大級の研究情報プラットフォーム。 約 20,000 誌の主要な学術雑誌に掲載された約 1.7 億本の論文が 25 の専門分野に分類、収載されている。	1900-現在 （1.7 億件）	2023/12/31 毎日更新	2023/8/1 2024/1/23	2009/1/1 - 2023/12/31
J-STAGE	国立研究開発法人科学技術振興機構 (JST) が提供する、日本国内の科学技術情報の電子ジャーナルプラットフォーム。 自然科学、人文・社会科学、学際領域等の分野について、国内 1,500 を超える発行機関が、3,000 誌以上のジャーナルや会議録等の刊行物を公開している。	1999-現在 （550 万件）	2023/12/31 毎日更新	2023/9/27 2024/1/22	2009/1/1 - 2023/12/31 （英文） 2009/1/1 - 2023/12/31 （和文）

2.2. 検索に使用した化合物名

検索に使用した化合物名を表 2－2－1～2－2－7 に示す。

WOSCC を用いて予備検索として製剤名 "ANVIL" を含む文献を検索したところ 7065 件が該当したが、ANVIL は、金属加工に用いられる語句であり、"ANVIL" を含み、かつ "pesticide" または "fungicide" を含む文献は 2 件のみであった。このうちの 1 件は農薬の薬効に関する研究であり、もう 1 件では "ANVIL" の語は噴霧器のノズルの名称に用いられていた。

同様に、J-STAGE を用いて製剤名 "ANVIL" もしくは「アンビル」を含む文献を検索したところ 3199 件が該当したが、"ANVIL" もしくは「アンビル」を含み、かつ "pesticide"、"fungicide"、「農薬」または「殺菌剤」を含む文献は 5 件のみであり、この 5 件の文献はいずれも農薬の薬

効に関する研究であった。

以上の理由より、以後の検索では "ANVIL" 及び「アンビル」を検索対象に含めなかった。

また、トリアゾール系農薬の共通代謝物である 1,2,4-トリアゾール、トリアゾール酢酸、トリアゾールアラニン及びトリアゾール乳酸について検索した結果については、「トリアゾール共通代謝物」として別途報告するため、検索対象には含めなかった。

表 2－2－1　検索に用いたキーワード：有効成分ヘキサコナゾール (WOSCC)

一般名	Hexaconazole
化学名	2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2-ol α-butyl-α-(2,4-dichlorophenyl)-1*H*-1,2,4-triazole-1-ethanol
CAS 番号	79983-71-4
その他名称(EC 番号)	413-050-7 616-763-3

表 2－2－2　検索に用いたキーワード：代謝物（または分解物）[a] (WOSCC)

代謝物、分解物	5-hydroxy-hexaconazole 2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2,5-diol 6-hydroxy-hexaconazole 2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2,6-diol

表 2－2－3　検索に用いたキーワード：有効成分ヘキサコナゾール (J-STAGE 英文キーワード検索)

一般名	Hexaconazole
化学名	2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2-ol α-butyl-α-(2,4-dichlorophenyl)-1*H*-1,2,4-triazole-1-ethanol
CAS 番号	79983-71-4
その他名称(EC 番号)	413-050-7 616-763-3

表 2－2－4　検索に用いたキーワード：代謝物（または分解物）(J-STAGE 英文キーワード検索)

代謝物、分解物	5-hydroxy-hexaconazole 2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2,5-diol 6-hydroxy-hexaconazole 2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2,6-diol

表 2－2－5　検索に用いたキーワード：有効成分ヘキサコナゾール (J-STAGE 和文キーワード検索)

一般名	Hexaconazole ヘキサコナゾール
化学名	2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2-ol α-butyl-α-(2,4-dichlorophenyl)-1*H*-1,2,4-triazole-1-ethanol 2-(2,4-ジクロロフェニル)-1-(1*H*-1,2,4-トリアゾール-1-イル)ヘキサン-2-オール α-ブチル-α-(2,4-ジクロロフェニル)-1*H*-1,2,4-トリアゾール-1-エタノール
CAS 番号	79983-71-4
その他名称(EC 番号)	413-050-7 616-763-3

表 2－2－6　検索に用いたキーワード：有効成分ヘキサコナゾールを含む製剤 (J-STAGE 和文キーワード検索)

製剤名	シバンバ EX[a)] シバンバ PRO[a)] 花セラピー[a)]

a)　これらの製剤は日本でのみ登録を有する製剤であるため、和文のみでの検索とした。

表 2－2－7　検索に用いたキーワード：代謝物（または分解物）(J-STAGE 和文キーワード検索)

代謝物、分解物	5-hydroxy-hexaconazole 2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2,5-diol 6-hydroxy-hexaconazole 2-(2,4-dichlorophenyl)-1-(1*H*-1,2,4-triazol-1-yl)hexan-2,6-diol ヘキサコナジオール-2,5 2-(2,4-ジクロロフェニル)-1- (1*H*-1,2,4-トリアゾール-1-イル)ヘキサン-2,5-ジオール ヘキサコナジオール-2,6 2-(2,4-ジクロロフェニル)-1- (1*H*-1,2,4-トリアゾール-1-イル)ヘキサン-2,6-ジオール

2.3. 評価対象となる影響

表 2－3－1　4 分野に関連する文献検索に用いた分類フィールド(WOSCC)

ヒトに対する毒性	"agriculture multidisciplinary" OR "allergy" OR "biochemistry molecular biology" OR "cell biology" OR "clinical neurology" OR "critical care medicine" OR "developmental biology" OR "emergency medicine" OR "endocrinology metabolism" OR "environmental sciences" OR "genetics heredity" OR "immunology" OR "medicine general internal" OR "medicine research experimental" OR "multidisciplinary sciences" OR "neurosciences" OR "oncology" OR "pediatrics" OR "pharmacology pharmacy" OR "physiology" OR "public environmental occupational health" OR "reproductive biology" OR "toxicology" OR "veterinary sciences"
農作物及び畜産物への残留	"agriculture multidisciplinary" OR "agriculture dairy animal science" OR "environmental sciences" OR "food science technology" OR "multidisciplinary sciences" OR "pharmacology pharmacy" OR "plant sciences" OR "veterinary sciences" OR "zoology"
生活環境動植物及び家畜に対する毒性	"agriculture multidisciplinary" OR "biochemistry molecular biology" OR "biodiversity conservation" OR "biology" OR "cell biology" OR "developmental biology" OR "ecology" OR "endocrinology metabolism" OR "entomology" OR "environmental sciences" OR "environmental studies" OR "fisheries" OR "marine freshwater biology" OR "microbiology" OR "multidisciplinary sciences" OR "neurosciences" OR "ornithology" OR "pharmacology pharmacy" OR "plant sciences" OR "reproductive biology" OR "toxicology" OR "veterinary sciences" OR "zoology"
環境動態	"agriculture multidisciplinary" OR "ecology" OR "environmental sciences" OR "environmental studies" OR "fisheries" OR "limnology" OR "marine freshwater biology" OR "multidisciplinary sciences" OR "soil science" OR "water resources"

表 2－3－2　4 分野に関連する文献検索に用いたキーワード(J-STAGE 英文キーワード検索)

ヒトに対する毒性	"mortality" OR "skin irritation" OR "eye irritation" OR "sensitization" OR "allergy" OR "hypersensitivity" OR "metabolism" OR "distribution" OR "absorption" OR "excretion" OR "kinetic" OR "PK" OR "TK" OR "cytochrome" OR "enzyme" OR "mutagen" OR "DNA" OR "genotoxicity" OR "carcinogen" OR "cancer" OR "tumor" OR "oncology" OR "immune" OR "neurotoxicity" OR "endocrine" OR "hormone" OR "development" OR "reproduction" OR "malformation" OR "maternal toxicity" OR "pregnancy" OR "embryo" OR "fetus" OR "offspring" OR "dermal" OR "exposure" OR "operator" OR "worker" OR "occupant" OR "biomonitoring" OR "medical" OR "poison" OR "apoptosis" OR "necrosis" OR "cytotoxic" OR "cohort" OR "epidemiology" OR "adverse effect" OR "case control"
農作物及び畜産物への残留	"uptake" OR "metabolism" OR "metabolic" OR "breakdown" OR "translocation" OR "degradation" OR "storage" OR "stability" OR "residue" OR "process" OR "preharvest" OR "postharvest" OR "preplant" OR "pre-emergence" OR "post-emergence" OR "processing factor" OR "conversion factor" OR "hydroxylation" OR "photolysis" OR "rotation" OR "succeed" OR "supervised trial" OR "field trial" OR "dietary exposure" OR "MRL" OR "maximum residue level" OR "maximum residue limit"
生活環境動植物及び家畜に対する毒性	"bioaccumulation" OR "bioconcentration" OR "biomagnification" OR "effect" OR "biodiversity" OR "protection goals" OR "eco" OR "impact" OR "population" OR "pest" OR "endocrine disrupt" OR "acute" OR "chronic" OR "long-term" OR "ecotoxicology" OR "colony" OR "hive" OR "aquatic" OR "freshwater" OR "macro-organism" OR "micro-organism" OR "microbial" OR "biodegradation"
環境動態	"degradation" OR "photo" OR "hydrolysis" OR "accumulate" OR "dissipation" OR "vapor pressure" OR "mobility" OR "adsorption" OR "desorption" OR "persistent" OR "pollution" OR "contamination" OR "aged residue" OR "column leaching" OR "leach" OR "lysimeter" OR "drift" OR "run-off" OR "atmosphere" OR "transport" OR "long-range transport" OR "short-range transport" OR "monitoring" OR "surveillance" OR "environmental" OR "exposure" OR "fate" OR "residue"

表 2−3−3　4 分野に関連する文献検索に用いたキーワード(J-STAGE 和文キーワード検索)

ヒトに対する毒性	"死亡率" OR "刺激性" OR "感作性" OR "アレルギー" OR "過敏症" OR "代謝" OR "分布" OR "吸収" OR "排泄" OR "動態" OR "キネティクス" OR "PK" OR "TK" OR "チトクローム" OR "酵素" OR "変異原" OR "DNA" OR "遺伝毒性" OR "発がん" OR "発癌" OR "腫瘍" OR "免疫" OR "神経毒性" OR "エンドクリン" OR "内分泌かく乱" OR "内分泌攪乱" OR "ホルモン" OR "発達" OR "発達毒性" OR "生殖" OR "奇形" OR "母体毒性" OR "妊娠" OR "胚" OR "胎児" OR "子孫" OR "経皮" OR "皮膚" OR "ばく露" OR "暴露" OR "曝露" OR "作業者" OR "使用者" OR "居住" OR "バイオモニタリング" OR "医学" OR "毒" OR "アポトーシス" OR "壊死" OR ”細胞毒性” OR "コホート" OR "疫学" OR "悪影響" OR "事例研究" OR "ケースコントロール"
農作物及び畜産物への残留	"取込" OR "吸収" OR "代謝" OR "分解" OR "移行" OR "保存" OR "貯蔵" OR "安定性" OR "残留" OR "過程" OR "プロセス" OR "収穫前" OR "収穫後" OR "移植" OR "発芽前" OR "発芽後" OR "加工因子" OR "処理能力" OR "換算係数" OR "加水分解" OR "光分解" OR "輪作" OR "後作" OR "管理試験" OR "監視下試験" OR "圃場試験" OR "野外試験" OR "食品経由" OR "MRL" OR "最大残留"
生活環境動植物及び家畜に対する毒性	"生物濃縮" OR "蓄積" OR "影響" OR "生物多様性" OR "環境保護目標" OR "生態" OR "集団" OR "病害" OR "エンドクリン" OR "内分泌かく乱" OR "内分泌攪乱" OR "急性" OR "慢性" OR "長期" OR "生態毒性" OR "コロニー" OR "巣" OR "水生" OR "淡水" OR "微生物" OR "生分解"
環境動態	"分解" OR "光" OR "加水分解" OR "濃縮" OR "消失" OR "蒸気圧" OR "移行性" OR "吸着" OR "脱着" OR "残留性" OR "汚染" OR "混入" OR "カラムリーチング" OR "ライシメーター" OR "ドリフト" OR "流出" OR "飛散" OR "流亡" OR "大気" OR "移動" OR "モニタリング" OR "サーベイ" OR "環境" OR "動態" OR "残留" OR "運命" OR "ばく露" OR "暴露" OR "曝露"

2.4. 評価対象の生物種等

表 2－4－1　評価対象となる生物種等に関するキーワード(WOSCC)

ヒトに対する毒性	"rat" OR "mouse" OR "mice" OR "dog" OR "rabbit" OR "monkey" OR "pig" OR "human" OR "hen" OR "S. typhimurium" OR "E. coli"
農作物及び畜産物への残留	"crop" OR "commodity" OR "feed" OR "livestock" OR "hen" OR "cattle" OR "goat" OR "pig" OR "ruminant" OR "cow" OR "poultry"
生活環境動植物及び家畜に対する毒性	"avian" OR "bird" OR "mallard duck" OR "quail" OR "bobwhite" OR "lemna" OR "alga" OR "fish" OR "crustacean" OR "aquatic" OR "chironomus" OR "bumble bee" OR "honey bee" OR "solitary bee" OR "pollinator" OR "apis"
環境動態	"soil" OR "water" OR "sediment"

表 2－4－2　評価対象となる生物種等に関するキーワード(J-STAGE 英文キーワード検索)

ヒトに対する毒性	"rat" OR "mouse" OR "mice" OR "dog" OR "rabbit" OR "monkey" OR "pig" OR "human" OR "hen" OR "S. typhimurium" OR "E. coli"
農作物及び畜産物への残留	"crop" OR "commodity" OR "feed" OR "livestock" OR "hen" OR "cattle" OR "goat" OR "pig" OR "ruminant" OR "cow" OR "poultry"
生活環境動植物及び家畜に対する毒性	"avian" OR "bird" OR "mallard duck" OR "quail" OR "bobwhite" OR "lemna" OR "alga" OR "fish" OR "crustacean" OR "aquatic" OR "chironomus" OR "bumble bee" OR "honey bee" OR "solitary bee" OR "pollinator" OR "apis"
環境動態	"soil" OR "water" OR "sediment"

表 2−4−3　評価対象となる生物種等に関するキーワード(J-STAGE 和文キーワード検索)

ヒトに対する毒性	"ラット" OR "マウス" OR "イヌ" OR "ウサギ" OR "サル" OR "ブタ" OR "人間" OR "ヒト" OR "ニワトリ" OR "チフス菌" OR "大腸菌"
農作物及び畜産物への残留	"作物" OR "植物" OR "食料" OR "飼料" OR "家畜" OR "ニワトリ" OR "乳牛" OR "ヤギ" OR "ブタ" OR "反すう動物" OR "反芻動物" OR "ウシ" OR "家きん" OR "家禽"
生活環境動植物及び家畜に対する毒性	"植物" OR "鳥類" OR "マガモ" OR "アヒル" OR "ウズラ" OR "ウキクサ" OR "藻類" OR " 魚" OR "甲殻類" OR "ミジンコ" OR "水生" OR "ユスリカ" OR "ハチ" OR "ミツバチ" OR "ハナバチ" OR "蜜蜂" OR "花粉媒介者"
環境動態	"土壌" OR "水" OR "底質"

3.　評価目的との適合性評価及び信頼性評価で設定した判断基準

3.1. 文献の表題及び概要に基づく適合性評価（第 1 段階）で設定した判断基準

適合性評価の第１段階として、文献の表題及び概要に基づき、下記の①から⑮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て、以降の検討から除いた。

① 当該農薬と関係しない論文（当該農薬の代替剤等）
② 政策、社会、経済分析に関する論文
③ 農産物等の生産、流通に関する論文
④ 薬効、薬害、物理的化学的性状に関する論文
⑤ 分析法やその開発に関する論文
⑥ 新規合成法や基礎化学の観点で記載された論文
⑦ 特許関連文献
⑧ リスク評価をする上で十分なデータや情報を含まない学会発表等の概要や総説、成書
⑨ リスク評価に使用できる新規のデータが提示されていない意見書
⑩ 科学論文や規制についての総説を含む二次情報において、当該文献が参照する一次資料（原著）の確認ができないもの
⑪ 一般的な農薬の暴露に関する論文（当該農薬に限定せず、広範囲の農薬について記載されたもの）
⑫ 異なる有効成分に由来する混合製剤の毒性に関する論文
⑬ 評価対象となる４分野（ヒトに対する毒性、農作物及び畜産物への残留、生活環境動植物及び家畜に対する毒性、環境動態）に関係しない論文
⑭ 日本で登録されている処方以外の製剤に関する論文
⑮ コンピュータシミュレーション等を用いたドライラボのみの論文

3.2. 文献の全文に基づく適合性評価（第 2 段階）で設定した判断基準

第 1 段階で除外した以外の公表文献について、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

① 当該農薬と関係しない論文（当該農薬の代替剤等）
② 政策、社会、経済分析に関する論文
③ 農産物等の生産、流通に関する論文
④ 薬効、薬害、物理的化学的性状に関する論文
⑤ 分析法やその開発に関する論文
⑥ 新規合成法や基礎化学の観点で記載された論文
⑦ 特許関連文献
⑧ リスク評価をする上で十分なデータや情報を含まない学会発表等の概要や総説、成書
⑨ リスク評価に使用できる新規のデータが提示されていない意見書
⑩ 科学論文や規制についての総説を含む二次情報において、当該文献が参照する一次資料（原著）の確認ができないもの
⑪ 一般的な農薬の暴露に関する論文（当該農薬に限定せず、広範囲の農薬について記載されたもの）
⑫ 異なる有効成分に由来する混合製剤の毒性に関する論文
⑬ 評価対象となる 4 分野（ヒトに対する毒性、農作物及び畜産物への残留、生活環境動植物及び家畜に対する毒性、環境動態）に関係しない論文
⑭ 日本で登録されている処方以外の製剤に関する論文
⑮ コンピュータシミュレーション等を用いたドライラボのみの論文
⑯ 試験設計、試験系、試験種、被験物質、暴露経路等が評価に活用する観点で妥当でないもの
   a) 試験方法が記載されていないもの
   b) 適切に評価できる試験種で実施されていないもの
   c) 適切な経路で投与／処理されていないもの
   d) 投与又は処理した被験物質量が明記されていないもの
   e) 被験物質の添加に用いた媒体が確認できないもの
   f) 分析法が記載されていないもの
⑰ 日本の代表的な使用方法／使用条件における評価に活用できない文献（ほ場条件、土性等）

（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、下記の分類基準に従って、全文をレビューし３つの区分に分類した。

＜分類基準＞

- 実施している試験環境がテストガイドライン（TG）で定める条件と合っていること

- 投与又は処理した被験物質の純度が明記されていること
- 統計解析が可能な動物数／例数が確保されていること
- 複数の用量で実施されていること（最低 3 用量で実施）
- 無処理区（コントロール区）が設定されており、TG に照らしその結果が適正であること
- 解析方法及び結果が報告されていること

ヒトに対する毒性に関して、区分 a に該当するかどうかについては、食品安全委員会で示された「定量的データ」として分類される下記基準を参考とした。

- 公表文献で用いられた用量が、研究内容と同等である安全性試験で用いられた最低用量よりも低いこと
- 公表文献の研究結果が、他の試験結果と比較できる単位を用いて報告されていること
- 研究の結論、エンドポイント及び用量が正確で、信頼でき、妥当であることを実証するための十分な情報が公表文献中に提供されており、研究結果が再現される可能性があると判断できること

表 3－2－1　評価目的への適合性がある文献の分類

区分	該当する文献
a	リスク評価パラメーター(ADI、ARfD、AOEL、残留基準、生活環境動植物の登録基準、水産 PEC 等)を設定又は見直すために利用可能と判断される文献
b	リスク評価パラメーターを設定する際の補足データとして利用が可能と想定される文献
c	a 又は b に分類されない文献

3.3. 論文の信頼性の評価基準

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、論文の信頼性を評価する方法として国際的に広く用いられている Klimisch 基準（表 3－3－1）における分類を参考として、適切な分類基準を設定し、信頼性を評価した。

表 3－3－1　Klimisch 基準の概要

分類	信頼性	判断基準
1	信頼性あり（制限なし）	以下のいずれかの試験/データに該当する場合。 ・有効性が確認された方法又は国際的に認められたテストガイドラインに基づいて実施されている(GLP 適合が望ましい)。 ・試験項目(評価パラメーター)が特定(国レベル)のテストガイドラインに基づいている。 ・全ての試験項目がテストガイドラインに示された方法と関連性が強い/同等により報告されている。
2	信頼性あり（制限あり）	以下のいずれかの試験/データに該当する場合。 ・試験項目は特定のテストガイドラインに完全には準拠していないが、内容が受け入れ可能である。 ・試験方法がテストガイドラインから逸脱しているものの、詳細な報告に基づき科学的に受け入れ可能な結果が示されている。
3	信頼性なし	試験系、被験物質又はばく露経路の妥当性、記載情報の不十分さ等の観点から、エキスパートジャッジのためには許容できないと考えられる試験/データ。
4	評価不能	試験の詳細が不明であり、要約のみの記載又は二次情報(書籍、総論等)として記載された試験/データ。

1. ヒトに対する毒性については、ToxRtool (Toxicological data Reliability assessment Tool)を分類基準として活用した。
   （https://joint-research-centre.ec.europa.eu/scientific-tools-and-databases/toxrtool-toxicological-data-reliability-assessment-tool_en）
2. それ以外の 3 分野については、6278 号局長通知で定めるテストガイドラインへの適用状況を中心に以下のような分類基準を設定し、Klimisch 基準のどの分類に該当するかを判断した。

(ア) 農作物及び畜産物への残留

① 試験した作物が TG で定める代表的な作物か
② 試験系の条件が明記されているか（たとえば、作物の生育ステージ、ほ場の状況、処理量、処理方法、処理時期、PHI、サンプリング方法）
③ サンプリング後の試料保管中の被験物質の安定性が検証されているか
④ サンプリング後の試料の保管条件が明記されているか
⑤ 栽培条件（密度や仕立て）が適切であるか
⑥ 処理量が登録で定める GAP の範囲内であるか

(イ) 生活環境動植物及び家畜に対する毒性

① 水生生物試験では、被験物質が水に溶解していること
② 供試した生物種の由来、飼育条件、系統、週齢、体重あるいは体長、等が明らかであること
③ 試験期間の環境（温度等）が TG に照らし適切であること

④ 試験期間を通じて計画した濃度で被験物質に暴露していること

⑤ 経時的な観察記録や結果の確認がなされていること

(ウ) 環境動態

① 試験系の条件が明記されていること（たとえば、土壌の試験であれば、土質、pH、有機炭素含量、密度、水分含量、微生物活性等）

② 試験に使用した土壌等が TG で定める条件を満たしていること

③ サンプリング方法が TG で定めた条件をみたしていること

④ サンプリング後の試料の保管中の被験物質の安定性が検証されていること

⑤ サンプリング後の試料の保管条件が明記されていること

4. 評価目的との適合性評価及び信頼性評価の結果

4.1. 各データベースを検索した結果のまとめ

表 4－1－1　Web of Science Core Collection における論文検索結果

データベース名	Web of Science Core Collection (WOSCC)		
検索日	2023 年 8 月 1 日、2024 年 1 月 23 日		
検索対象期間	2009 年 1 月 1 日 - 2023 年 12 月 31 日		
最終の更新日	2023 年 12 月 31 日		
検索に用いた分類フィールド及びキーワード	①：表 2－2－1~2		
	②：表 2－3－1		
	③：表 2－4－1		
検索結果 検索条件(分類フィールド及びキーワード)	①	① AND ②	(① AND ②) AND ③
対象とする農薬名で検索抽出した総論文数	373	N/A	N/A
ヒトに対する毒性*	N/A	169	45
農作物及び畜産物への残留*	N/A	174	25
生活環境動植物及び家畜に対する毒性*	N/A	219	15
環境動態*	N/A	116	70

＊：4 分野間での重複あり

N/A：該当するデータなし

表 4－1－2　J-STAGE における論文検索結果（英文キーワード検索）

データベース名	J-STAGE（英文キーワード検索）		
検索日	2023 年 9 月 27 日、2024 年 1 月 22 日		
検索対象期間	2009 年 1 月 1 日 - 2023 年 12 月 31 日		
最終の更新日	2023 年 12 月 31 日		
検索に用いたキーワード	①：表 2－2－3~4		
	②：表 2－3－2		
	③：表 2－4－2		
検索結果 検索条件(キーワード)	①	① AND ②	(① AND ②) AND ③
対象とする農薬名で検索抽出した総論文数	38	N/A	N/A
ヒトに対する毒性*	N/A	28	12
農作物及び畜産物への残留*	N/A	29	9
生活環境動植物及び家畜に対する毒性*	N/A	27	7
環境動態*	N/A	32	21

＊：4 分野間での重複あり。
N/A：該当するデータなし。

表 4－1－3　J-STAGE における論文検索結果（和文キーワード検索）

データベース名	J-STAGE（和文キーワード検索）		
検索日	2023 年 9 月 27 日、2024 年 1 月 22 日		
検索対象期間	2009 年 1 月 1 日 - 2023 年 12 月 31 日		
最終の更新日	2023 年 12 月 31 日		
検索に用いたキーワード	①：表 2－2－5~7		
	②：表 2－3－3		
	③：表 2－4－3		
検索結果 検索条件(キーワード)	①	① AND ②	(① AND ②) AND ③
対象とする農薬名で検索抽出した総論文数	74	N/A	N/A
ヒトに対する毒性*	N/A	44	21
農作物及び畜産物への残留*	N/A	51	43
生活環境動植物及び家畜に対する毒性*	N/A	62	43
環境動態*	N/A	62	25

＊：4 分野間での重複あり。
N/A：該当するデータなし。

表 4－1－4　すべてのデータベースの検索結果を統合したまとめ

分野	論文数			
	WOSCC	J-STAGE		計**
		英文キーワード検索	和文キーワード検索	
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)	373	38	74	485
ヒトに対する毒性に関する論文数*	45	12	21	78
農作物及び畜産物への残留に関する論文数*	25	9	43	77
生活環境動植物及び家畜に対する毒性に関する論文数*	15	7	43	65
環境動態に関する論文数*	70	21	25	116

*：4 分野間での重複あり。
**：J-STAGE の英文キーワード検索と和文キーワード検索の間に重複あり。
（WOSCC 検索と J-STAGE 検索の間には重複する文献はなかった。）

4.2. 評価目的との適合性評価（第 1 段階、第 2 段階）の結果のまとめ

表 4－2－1　評価目的との適合性評価(第 1 段階、第 2 段階)の結果のまとめ（WOSCC）

分野	該当する論文数	第 1 段階		第 2 段階	
		適合性なし	それ以外(第 2 段階へ)	適合性なし	適合性あり
ヒトに対する毒性	25	8	17	2	15
農作物及び畜産物への残留	18	5	13	10	3
生活環境動植物及び家畜に対する毒性	14	4	10	5	5
環境動態	29	11	18	13	5
上記以外*	44	44	0	0	0
合計	130	72	58	30	28

*：文献の表題、概要あるいは全文での適合性評価を実施した結果、上記 4 分野には該当しなかった文献数。

表 4－2－2　評価目的との適合性評価(第 1 段階、第 2 段階)の結果のまとめ（J-STAGE）

分野	該当する論文数	第 1 段階		第 2 段階	
		適合性なし	それ以外 (第 2 段階へ)	適合性なし	適合性あり
ヒトに対する毒性	3	1	2	2	0
農作物及び畜産物への残留	19	15	4	4	0
生活環境動植物及び家畜に対する毒性	4	0	4	4	0
環境動態	3	2	1	1	0
上記以外*	39	39	0	0	0
合計	68	57	11	11	0

*：文献の表題、概要あるいは全文での適合性評価を実施した結果、上記 4 分野には該当しなかった文献数

4.3. 適合性評価の第 2 段階で適合性ありとされた文献と分類結果

表 4－3－1　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（WOSCC）

分野	該当する論文数		
	区分 a	区分 b	区分 c
ヒトに対する毒性	0	1	14
農作物及び畜産物への残留	0	0	3
生活環境動植物及び家畜に対する毒性	0	1	4
環境動態	0	0	5
合計	0	2	26

J-STAGE 検索に関しては、適合性評価第 2 段階で適合性ありと判断された文献はなかった。

4.4. 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

＊：判断理由欄の〇囲み数字は、3.2 に記載した判断理由の項目番号を示す。

表 4－4－1　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(ヒトに対する毒性、WOSCC)

文献番号	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＊
W027	II 5.5.3	Chattopadhyay, S., *et al*.	2020	Morphogen signaling by Wnt/beta-catenin pathway and microenvironmental alteration in the bone marrow of agricultural pesticide exposure-induced experimental aplastic anemia	Journal of Biochemical and Molecular Toxicology Vol.34-9 http://dx.doi.org/10.1002/jbt.22523	⑫農薬 3 種類の混合製剤の毒性に関する研究。
W030	II 5	de Albuquerque, N,C.P., *et al*.	2018	Metabolism studies of chiral pesticides: A critical review	Journal of Pharmaceutical and Biomedical Analysis Vol.147, 89-109 https://doi.org/10.1016/j.jpba.2017.08.011	⑧キラル性農薬の代謝に関する総説。

表 4－4－2　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(農作物及び畜産物への残留、WOSCC)

文献番号	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＊
W023	II 6.3.4	Jeong, H.R., *et al*.	2012	Monitoring and risk assessment of pesticides in fresh omija (*Schizandra chinensis* Baillon) fruit and juice	Food and Chemical Toxicology Vol.50-2, 385-389 http://dx.doi.org/10.1016/j.fct.2011.10.064	⑰韓国産チョウセンゴミシに散布された残留農薬調査。
W033	II 6.3.4	Mohapatra, S., *et al*.	2020	Persistence and dissipation study of azoxystrobin, buprofezin, dinocap and hexaconazole on mango (*Mangifera indica* L.)	Environmental Science and Pollution Research Vol.27-26, 32820-32828 http://dx.doi.org/10.1007/s11356-020-09557-8	⑰インド産マンゴーにおける残留調査。 熱帯サバナ気候下における圃場試験であり、日本の代表的な使用条件における評価に活用できない。

表 4−4−2　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(農作物及び畜産物への残留、WOSCC)

文献番号	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*
W073	II 6.3.4	Wang, Y., *et al*.	2015	Dissipation behavior of hexaconazole and kresoxim-methyl residues in ginseng and soil under field conditions	Environmental Monitoring and Assessment Vol.187-1 http://dx.doi.org/10.1007/s10661-014-4126-6	⑫混合製剤の高麗人参への残留調査。
W075	II 6.3.4	Majumder, S., *et al*.	2022	Residue dissipation kinetics, safety evaluation and decontamination of hexaconazole in green chilli	International Journal of Environmental Analytical Chemistry http://dx.doi.org/10.1080/03067319.2022.2078201	⑰インドにおける青とうがらしの残留調査。 亜熱帯モンスーン気候下における圃場試験であり、日本の代表的な使用条件における評価に活用できない。
W077	II 6.3.4	Jiang, D.D., *et al*.	2018	Evaluation of the safe application of copper nonylphenolsulfonate and hexaconazole in wax gourd under field conditions	Ecotoxicology and Environmental Safety Vol.159, 71-76 http://dx.doi.org/10.1016/j.ecoenv.2018.04.037	⑯b 日本で一般的に食用に供さないひょうたんを対象とした、中国における残留調査。
W108	II 6.3.4	Kottiappan, M., *et al*.	2013	Monitoring of pesticide residues in South Indian tea	Environmental Monitoring and Assessment Vol.185-8, 6413-6417 http://dx.doi.org/10.1007/s10661-012-3034-x	⑪⑰インド南部の標高 1000m 以上の高地圃場における茶の農薬残留スクリーニング調査。
W115	II 6.3.4	Swami, S., *et al*.	2021	Effect of ozone application on the removal of pesticides from grapes and green bell peppers and changes in their nutraceutical quality	Journal of Environmental Science and Health Part B Pesticides Food Contaminants and Agricultural Wastes Vol.56-8, 722-730 http://dx.doi.org/10.1080/03601234.2021.1940660	⑬オゾン水を用いた作物残留農薬除去技術の研究。

表 4−4−2　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(農作物及び畜産物への残留、WOSCC)

文献番号	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*
W134	II 7	Pezhhanfar, S., *et al*.	2023	AlFu nano MOF-based dispersive micro solid phase extraction of pesticides; the comparison of preconcentration via evaporation and dispersive liquid-liquid microextraction	International Journal of Environmental Analytical Chemistry http://dx.doi.org/10.1080/03067319.2023.2201447	⑬飲料からの農薬検出技術の開発。
W209	II 6.3.4	Sharma, N., *et al*.	2022	Multi-residue determination of pesticides in vegetables and assessment of human health risks in Western Himalayan region of India	Environmental Monitoring and Assessment Vol.194-5 http://dx.doi.org/10.1007/s10661-022-09992-9	⑪⑰インド高地における作物残留スクリーニング調査。
W213	II 6.3.4	Seenivasan, S., *et al*.	2011	Survey on the pesticide residues in tea in south India	Environmental Monitoring and Assessment Vol.176-45295, 365-371 http://dx.doi.org/10.1007/s10661-010-1589-y	⑰インドにおける加工後の茶の残留スクリーニング調査。 ヘキサコナゾールは検出されていない。

表 4−4−3　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(生活環境動植物及び家畜に対する毒性、WOSCC)

文献番号	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*
W056	II 8.2	Wang, H.T., *et al*.	2022	Toxicity of Hexaconazole to *Daphnia magna Chlorella vulgaris* and Juvenile *Paramisgurnus dabryanus*	Fresenius Environmental Bulletin Vol.31-3, 2813-2816	⑯a 水生生物 3 種に対するヘキサコナゾールの毒性調査。 試験方法の詳細（試験群構成や環境条件等）や結果の定量的データ（試験群ごとの遊泳阻害数や成長阻害率、死亡数等）が記載されていない。

表 4−4−3　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(生活環境動植物及び家畜に対する毒性、WOSCC)

文献番号	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*
W061	II 8.3.1.3	Sisodia, A.V., *et al*.	2016	Haematological Assessment on Toxicity of Fungicide Hexaconazole on Post larvae of *Macrobrachium rosenbergii* (de Man)	Fishery Technology Vol.53-1, 64-68	⑫⑯b オニテネガエビに対する、ヘキサコナゾールを含む混合製剤の環境毒性研究。
W062	II 8.4	Baird, T.D., *et al*.	2010	Descriptive and Mechanistic Toxicity of Conazole Fungicides Using the Model Test Alga *Dunaliella tertiolecta* (Chlorophyceae)	Environmental Toxicology Vol.25-3, 213-220 http://dx.doi.org/10.1002/tox.20493	⑯b 塩湖に生息する緑藻 *Dunaliella tertiolecta* に対する毒性調査。
W064	II 8.2	Choudhurya, N., *et al*.	2017	Assessment of Antioxidant Biomarkers and Protein Levels in Tissues of *Oreochromis mossambicus* and *Channa punctatus* Exposed to Toxicity by Fungicides	Turkish Journal of Fisheries and Aquatic Sciences Vol.17-3, 487-498 http://dx.doi.org/10.4194/1303-2712-v17_3_05	⑯b インド産の淡水魚類 2 種に対する毒性調査。 両種とも日本の在来種ではない。
W085	II 8.9.1	Liu, T., *et al*.	2021	Enantioselective residues and toxicity effects of the chiral triazole fungicide hexaconazole in earthworms (*Eisenia fetida*)	Environmental Pollution Vol.270 http://dx.doi.org/10.1016/j.envpol.2020.116269	⑯b 適切に評価できる試験種ではないシマミミズに対する毒性研究。

表 4−4−4　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(環境動態、WOSCC)

文献番号	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*
W051	II 7.12	Chau, N.D.G., *et al*.	2015	Pesticide pollution of multiple drinking water sources in the Mekong Delta, Vietnam: evidence from two provinces	Environmental Science and Pollution Research Vol.22-12, 9042-9058 http://dx.doi.org/10.1007/s11356-014-4034-x	⑰ベトナムにおける表層水の環境モニタリング調査。

表 4−4−4　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(環境動態、WOSCC)

文献番号	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*
W052	II 7.4	Bielska, L., *et al*.	2021	A review on the stereospecific fate and effects of chiral conazole fungicides	Science of the Total Environment Vol.750 http://dx.doi.org/10.1016/j.scitotenv.2020.141600	⑧キラル性農薬の環境動態に関する総説。
W069	II 7.4.1	Fang, S., *et al*.	2019	Adsorption behavior of three triazole fungicides on polystyrene microplastics	Science of the Total Environment Vol.691, 1119-1126 http://dx.doi.org/10.1016/j.scitotenv.2019.07.176	⑰マイクロプラスチックによるヘキサコナゾールの吸着／脱着動態の研究。
W074	II 6.3.4	Maznah, Z., *et al*.	2015	Dissipation of the fungicide hexaconazole in oil palm plantation	Environmental Science and Pollution Research Vol.22-24, 19648-19657 http://dx.doi.org/10.1007/s11356-015-5178-z	⑯b 日本で作物として栽培されないアブラヤシの圃場土壌残留試験。
W079	II 7.3.1	Maznah, Z., *et al*.	2018	Evaluating Hexaconazole Leaching in Laboratory and Field Experiments: Effects of Application Rate, Soil Type, and Simulated Rainfall	Polish Journal of Environmental Studies Vol.27-5, 2163-2170 http://dx.doi.org/10.15244/pjoes/78043	⑯b 日本で作物として栽培されないヤシの圃場を想定したカラムリーチング試験。
W094	II 7.3.2	Arora, S., *et al*.	2014	Pesticide residue analysis of soil, water, and grain of IPM basmati rice	Environmental Monitoring and Assessment Vol.186-12, 8765-8772 http://dx.doi.org/10.1007/s10661-014-4042-9	⑯インド北部における総合病害虫管理（IPM）の効果評価。 具体的な実施方法が記載されていない。

表 4−4−4　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(環境動態、WOSCC)

文献番号	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*
W097	II 7.2.4	Fenoll, J., *et al*.	2010	Solarization and biosolarization enhance fungicide dissipation in the soil	Chemosphere Vol.79-2, 216-220 http://dx.doi.org/10.1016/j.chemosphere.2010.01.034	⑬土壌のソラリゼーション／バイオソラリゼーションによる農薬除去法の開発。
W104	II 7	Nodeh, H.R., *et al*.	2019	Equilibrium, kinetic and thermodynamic study of pesticides removal from water using novel glucamine-calix[4]arene functionalized magnetic graphene oxide	Environmental Science-Processes & Impacts Vol.21-4, 714-726 http://dx.doi.org/10.1039/c8em00530_cc8em00530_c	⑬磁性酸化グラフェンを用いた農薬除去法の開発。
W109	II 7.4	Zhang, S.W., *et al*.	2023	Spatial assessment of triazole organic compounds in surface water from the coastal estuaries to the East China sea	Environmental Pollution Vol.320 http://dx.doi.org/10.1016/j.envpol.2023.121024	⑪⑰中国東シナ海沿岸の河口及び沿岸海域における環境モニタリング調査。 日本の代表的な使用方法／使用条件における評価に活用できない。
W110	II 7	Navarro, S., *et al*.	2009	Photocatalytic degradation of eight pesticides in leaching water by use of ZnO under natural sunlight	Journal of Hazardous Materials Vol.172-44960, 1303-1310 http://dx.doi.org/10.1016/j.jhazmat.2009.07.137	⑬光触媒を用いた農薬の分解・除去方法の開発。
W111	II 7	Kamboh, M.A., *et al*.	2021	Green sporopollenin supported cyanocalixarene based magnetic adsorbent for pesticides removal from water: Kinetic and equilibrium studies	Environmental Research Vol.201 http://dx.doi.org/10.1016/j.envres.2021.111588	⑬水系からの農薬除去に関する新規技術の開発。

表 4−4−4　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(環境動態、WOSCC)

文献番号	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*
W131	II 7	Zendegi-Shiraz, A., *et al*.	2021	Removal and degradation of triazole fungicides using Ag/PEG-CuO: an efficient adsorbent-catalyst coupling process An ACC process for triazole fungicides treatment	International Journal of Environmental Analytical Chemistry http://dx.doi.org/10.1080/03067319.2021.1972988	⑬ポリエチレングリコール/酸化銅を用いた汚水からの農薬除去法の開発。
W211	II 8.11	Ren, P., *et al*.	2023	Spatial distribution and risk assessment of conazole fungicides in surface seawater of the East China Sea	Marine Pollution Bulletin Vol.189 http://dx.doi.org/10.1016/j.marpolbul.2023.114796	⑰中国の海洋表層水における農薬分布調査。

表 4−4−5　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(ヒトに対する毒性、J-STAGE)

文献番号	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
J002	II 5	Yamazoe, Y., *et al*.	2020	Prediction and Characterization of CYP3A4-mediated Metabolisms of Azole Fungicides: an Application of the Fused-grid Template system	Food Safety 8 巻 2 号 34-51 https://doi.org/10.14252/foodsafetyfscj.D-20-00010	⑪⑮アゾール系農薬 20 種類がヒト CYP3A4 に与える影響に関する *in silico* 研究。
J005	II 5	Bhupinder S.S.	2009	Chiral pesticides	Journal of Pesticide Science 34 巻 1 号 1-12 https://doi.org/10.1584/jpestics.R08-03	⑧異性体を持つ農薬に関する総説。

表 4−4−6　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(農作物及び畜産物への残留、J-STAGE)

文献番号	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
J076	II 6.3.4	米田正樹, 他	2020	キハダの果実および葉の農薬分析法の妥当性評価および残留農薬実態調査	日本食品化学学会誌 27 巻 1 号 1-9 https://doi.org/10.18891/jjfcs.27.1_1	⑪広範囲の農薬の残留に関するスクリーニング研究であり、ヘキサコナゾールは検出されなかった。
J115	II 6.3.4	北川陽子, 他	2017	農産物中の残留農薬の検査結果 (平成 28 年度)	食品衛生学雑誌 2017 巻 1 号 47-56 https://doi.org/10.24693/aroiph.2017.1_47	⑪約 80 種類の野菜/果実における 221 種類の農薬の残留スクリーニング調査。
J123	II 6.3.4	山口能宏, 他	2020	薬用植物栽培における使用農薬の実態調査（第 3 報）中国産サンシシの使用農薬	生薬学雑誌 74 巻 1 号 10-19 https://doi.org/10.24684/jspharm.74.1_10	①⑪中国産サンシシ（クチナシ）の残留農薬スクリーニング調査。 ヘキサコナゾールに関する記述/データを含まない。
J125	II 6.3.4	向田有希, 他	2021	薬用植物栽培における使用農薬の実態調査（第 4 報）中国産サンシュユの使用農薬	生薬学雑誌 75 巻 1 号 18-24 https://doi.org/10.24684/jspharm.75.1_18	①⑪中国産サンシュユの残留農薬スクリーニング調査。 ヘキサコナゾールに関する記述/データを含まない。

表 4−4−7　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(生活環境動植物及び家畜に対する毒性、J-STAGE)

文献番号	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
J001	II 5	González-Marín, B., *et al*.	2021	Movento® 240SC (Spirotetramat) and Envidor® 240SC (Spirodiclofen) keto-enol insecticides induce DNA damage in *Drosophila melanogaster* ovaries	Fundamental Toxicological Sciences, 8 巻 3 号 81-88 https://doi.org/10.2131/fts.8.81	①他農薬の環境毒性研究。

表 4－4－7　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(生活環境動植物及び家畜に対する毒性、J-STAGE)

文献番号	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
J027	II 8.2	Katagi, T.	2020	*In vitro* metabolism of pesticides and industrial chemicals in fish	Journal of Pesticide Science 45 巻 1 号 1-15 https://doi.org/10.1584/jpestics.D19-074	⑬魚毒性に関する *in vivo* 研究と *in vitro* 研究を比較する文献研究。
J029	II 7.12	吉村弥奈美, 他	2013	GC/MS 一斉分析データベースとヒメダカ仔魚濃縮毒性試験を用いた流域内の化学物質と毒性の挙動調査	土木学会論文集 G（環境） 69 巻 7 号 III_393-III_400 https://doi.org/10.2208/jscejer.69.III_393	⑪住居地域の表層水に対する環境スクリーニング調査。
J067	II 8.10	豊田剛己, 他	2011	農薬による土壌微生物の活動制御	Journal of Pesticide Science 36 巻 1 号 119-123 https://doi.org/10.1584/jpestics.W10-80	⑧農薬が土壌微生物活動に及ぼす影響に関する総説。

表 4－4－8　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(環境動態、J-STAGE)

文献番号	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
J074	II 7.3	山本幸洋	2014	農耕地土壌における農薬の動態解明と農薬による硝酸化成阻害に関する研究	日本土壌肥料学雑誌 85 巻 5 号 418-419 https://doi.org/10.20710/dojo.85.5_418	⑯a 農耕地土壌における農薬の動態に関する短報 4 件。 リスク評価をするための具体的なデータを含まない。

4.5. 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

表 4－5－1　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(ヒトに対する毒性、WOSCC)

文献番号	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
W010	II 5	Shi, Y.H., *et al.*	2017	Factors Affecting the Bioaccessibility and Intestinal Transport of Difenoconazole, Hexaconazole, and Spirodiclofen in Human Caco-2 Cells Following *in Vitro* Digestion	Journal of Agricultural and Food Chemistry Vol.65-41，9139-9146 http://dx.doi.org/10.1021/acs.jafc.7b02781	ヒトの消化管経由での農薬摂取動態に関する *in vitro* 研究。 リスク評価に直接活用できるエンドポイントを含まないが、ヘキサコナゾールの経口生体到達度（対 MRL 比）が示されており、補足データとして利用が可能と判断した。

表 4－5－2　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(生活環境動植物及び家畜に対する毒性、WOSCC)

文献番号	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
W057	II 8.3.1.1	Han, J.J., *et al.*	2013	Bioactivity, toxicity and dissipation of hexaconazole enantiomers	Chemosphere Vol.93-10, 2523-2527 http://dx.doi.org/10.1016/j.chemosphere.2013.09.052	ヘキサコナゾールのラセミ体、R 体及び S 体に関する水生生物毒性、薬効、作物残留の各比較研究。 水生生物毒性試験はオオミジンコを用いて OECD 試験ガイドラインに基づき実施され、各異性体の EC_{50} 値が求められている。 補足データとして利用が可能と判断した。

4.6. 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

表 4－6－1　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(ヒトに対する毒性、WOSCC)

文献番号	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
W001	II 5	Zhang, P., *et al*.	2012	Enantioselective degradation of hexaconazole in rat hepatic microsomes *in vitro*	Chirality Vol.24-4, 283-288 http://dx.doi.org/10.1002/chir.21993	ラット肝ミクロソーム内におけるヘキサコナゾールの異性体間の半減期の代謝比較研究。 IC_{50} の差異（(＋)体：64.16μM、(-)体：34.20μM）等が示されており、参考資料として区分 c とした。
W002	II 5	Shen, Z.G., *et al*.	2013	Gender-Related *In Vitro* Metabolism of Hexaconazole and Its Enantiomers in Rats	Chirality Vol.25-12, 852-857 http://dx.doi.org/10.1002/chir.22225	ラット肝ミクロソームにおけるヘキサコナゾール代謝を調査。 異性体間及び雌雄間の反応速度の差異について言及しており、参考資料として区分 c とした。
W003	II 5	Abdi, S.A.H., *et al*.	2022	Hexaconazole exposure ravages biosynthesis pathway of steroid hormones: revealed by molecular dynamics and interaction	Toxicology Research Vol.11-1, 60-76 http://dx.doi.org/10.1093/toxres/tfab113	分子動力学的シミュレーションにより、ヘキサコナゾールと 6 種類の主要酵素との相互作用機構を調査。 ヘキサコナゾールがステロイド生成経路の進行に関与する酵素の活性部位と強く結合することが見出され、ホルモン合成の破壊または強力な内分泌かく乱につながる可能性が示唆された。シュミレーションでありリスク評価に使用しないとし、区分 c とした。

表 4−6−1　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(ヒトに対する毒性、WOSCC)

文献番号	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
W004	II 5	Yang, N., *et al*.	2023	Enantioselective toxicity effect and mechanism of hexaconazole enantiomers to human breast cancer cells	Food and Chemical Toxicology Vol.173 http://dx.doi.org/10.1016/j.fct.2023.113612	ヒト乳がん細胞を用いた細胞毒性研究。 異性体間の毒性の差異と、その差異を生じるメカニズムについての記述があり、参考資料として区分 c とした。
W006	II 5	Luo, G.F., *et al*.	2023	Stereoselective Toxicokinetic and Distribution Study on the Hexaconazole Enantiomers in Mice	Toxics Vol.11-2 http://dx.doi.org/10.3390/toxics11020145	マウスを用いたヘキサコナゾール異性体間の動態差異の研究。 S 体と R 体との間で半減期が異なることが臓器別に示されており、参考資料として区分 c とした。
W009	II 5	Sun, D.L., *et al*.	2021	The discovery of combined toxicity effects and mechanisms of hexaconazole and arsenic to mice based on untargeted metabolomics	Ecotoxicology and Environmental Safety Vol.226 http://dx.doi.org/10.1016/j.ecoenv.2021.112859	ヘキサコナゾールの毒性にヒ素が与える影響に関する調査。 ヘキサコナゾール単体での投与も行われ、メタボロミクス解析により主として脂質関連の代謝への影響が示唆された。1 用量のみで行われ、代謝物解析試験であるため、リスク評価に使用しないとし、区分 c とした。
W015	II 5	Nie, J., *et al*.	2023	Studies on the interaction of five triazole fungicides with human renal transporters in cells	Toxicology *In Vitro* Vol.88 http://dx.doi.org/10.1016/j.tiv.2023.105555	5 種類のトリアゾール系殺菌剤がヒト腎臓トランスポーターに与える影響に関する *in vitro* 研究。 リスク評価に直接活用できる定量的データを含まないが、ヘキサコナゾールが阻害するトランスポーターが特定されており、参考資料として区分 c とした。

表 4−6−1　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(ヒトに対する毒性、WOSCC)

文献番号	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
W017	II 5	Xu, J.Y., *et al*.	2020	Comparative cytotoxic effects of five commonly used triazole alcohol fungicides on human cells of different tissue types	Journal of Environmental Science and Health Part B Pesticides Food Contaminants and Agricultural Wastes Vol.55-5, 438-446 http://dx.doi.org/10.1080/03601234.2019.1709377	トリアゾール系殺菌剤が 4 種類のヒト由来細胞に与える影響を調査。定性的データが主であり（ヘキサコナゾールの定量的データは HeLa 細胞の IC_{50}＞100 μM のみ）、参考資料として区分 c とした。
W018	II 5	Kojima, H., *et al*.	2012	Inhibitory effects of azole-type fungicides on interleukin-17 gene expression via retinoic acid receptor-related orphan receptors alpha and gamma	Toxicology and Applied Pharmacology Vol.259-3, 338-345 http://dx.doi.org/10.1016/j.taap.2012.01.011	5 種類のトリアゾール系殺菌剤がヒトの免疫系に与える影響に関する *in vitro* 研究。農薬の評価に直接可能なエンドポイントは示されていないが、免疫系に与える影響の機序が示唆されており、参考資料として区分 c とした。
W028	II 5	Roelofs, M.J.E., *et al*.	2014	Conazole fungicides inhibit Leydig cell testosterone secretion and androgen receptor activation *in vitro*	Toxicology Reports Vol.1, 271-283 http://dx.doi.org/10.1016/j.toxrep.2014.05.006	コナゾール系殺菌剤がアンドロゲン活性に与える影響に関する *in vitro* 研究。リスク評価に直接活用できるデータを含まないが、濃度依存的なテストステロン分泌阻害が定量的データとして示されており（IC_{50}：23.2μM）、参考資料として区分 c とした。

表 4−6−1　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(ヒトに対する毒性、WOSCC)

文献番号	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
W122	II 5	Lv, X., *et al*.	2017	Effects of triazole fungicides on androgenic disruption and CYP3A4 enzyme activity	Environmental Pollution Vol.222, 504-512 http://dx.doi.org/10.1016/j.envpol.2016.11.051	農薬 5 種類の内分泌かく乱作用の機序に関する研究。リスク評価に直接活用できるデータを含まないが、各農薬の抗アンドロゲン活性と CYP3A4 阻害能との間の高い相関が報告されており、参考資料として区分 c とした。
W208	II 5	Wang, Y., *et al*.	2015	Monitoring tryptophan metabolism after exposure to hexaconazole and the enantioselective metabolism of hexaconazole in rat hepatocytes *in vitro*	Journal of Hazardous Materials Vol.295, 9-16 http://dx.doi.org/10.1016/j.jhazmat.2015.04.006	ラット肝細胞の代謝能、細胞毒性等について、ヘキサコナゾールの異性体間の差異を調査。リスク評価に直接活用できるデータを含まないが、異性体間の EC_{50} の差異が示されており（ラセミ体：71.62μM、(＋)：62.71μM、(－)：67.94μM）、参考資料として区分 c とした。
W212	II 5.3.2	Sun, D.L., *et al*.	2023	Sub-chronic exposure to hexaconazole affects the lipid metabolism of rats through mTOR-PPAR-γ/SREBP1 signaling pathway mediated by oxidative stress	Pesticide Biochemistry and Physiology Vol.197 http://dx.doi.org/10.1016/j.pestbp.2023.105646	脂質代謝経路の応答を調査。ラット短期投与試験（2 用量）において、脂質代謝経路の反応を確認した。NOAEL 等のエンドポイントは示されておらず、リスク評価に使用しないとし、区分 c とした。

表 4－6－1　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(ヒトに対する毒性、WOSCC)

文献番号	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
W214	II 5	Ku, T.T., *et al*.	2023	Triazole fungicides exert neural differentiation alteration through H3K27 me3 modifications: *In vitro* and *in silico* study	Journal of Hazardous Materials Vol.459 http://dx.doi.org/10.1016/j.jhazmat.2023.132225	毒性機作の解明を目的としてマウス胚を用いた発生毒性研究。 毒性機作の解明を目的としており、リスク評価に直接活用できる定量的データを含まないが、神経発生に与える影響の作用機作が示唆されており、参考資料として区分 c とした。

表 4－6－2　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(農作物及び畜産物への残留、WOSCC)

文献番号	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
W070	II 6.3.4	Liang, H.W., *et al*.	2012	The decline and residues of hexaconazole in tomato and soil	Environmental Monitoring and Assessment Vol.184-3, 1573-1579 http://dx.doi.org/10.1007/s10661-011-2061-3	中国の 2 都市におけるトマトの残留農薬調査。 2 都市の間で半減期に大きな差異があり、気温等の環境条件の影響が示唆されている。参考資料として区分 c とした。
W078	II 7.3.2	Zhang, K.K., *et al*.	2016	Fate of hexaconazole and isoprothiolane in rice, soil and water under field conditions	International Journal of Environmental Analytical Chemistry Vol.96-1, 38-49 http://dx.doi.org/10.1080/03067319.2015.1128535	中国の水田におけるフィールド土壌/作物残留調査。 玄米中の残留濃度は調査地の最大残留基準値を大きく下回っており、農薬の評価に直接活用できないが、参考資料として区分 c とした。

表 4−6−2　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(農作物及び畜産物への残留、WOSCC)

文献番号	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
W080	II 6.3.4	Wang, X.Q., *et al*.	2012	Enantioselective Residue Dissipation of Hexaconazole in Cucumber (*Cucumis sativus* L.), Head Cabbage (*Brassica oleracea* L. var. *caulorapa* DC.), and Soils	Journal of Agricultural and Food Chemistry Vol.60-9, 2212-2218 http://dx.doi.org/10.1021/jf204523t	中国におけるキュウリとブロッコリー及び土壌中におけるヘキサコナゾール異性体の残留調査。 異性体間の動態の差異が土壌中と作物中では異なることが示されており、参考資料として区分 c とした。

表 4−6−3　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(生活環境動植物及び家畜に対する毒性、WOSCC)

文献番号	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
W055	II 8.6	Huang, L.D., *et al*.	2012	Enantioselective Toxic Effects of Hexaconazole Enantiomers Against Scenedesmus Obliquus	Chirality Vol.24-8, 610-614 http://dx.doi.org/10.1002/chir.22018	イカダモを用いたヘキサコナゾールの異性体間の毒性比較調査。 ラセミ体、R 体、S 体各々の EC_{50} 値を得ている。 適切に評価できる試験種ではないが、実施方法は OECD 試験ガイドラインに準拠しており、参考資料として区分 c とした。
W058	II 8.2	Yu, L., *et al*.	2013	Thyroid endocrine disruption in zebrafish larvae following exposure to hexaconazole and tebuconazole	Aquatic Toxicology Vol.138, 35-42 http://dx.doi.org/10.1016/j.aquatox.2013.04.001	ゼブラフィッシュの代謝への影響に関する研究。 リスク評価に直接活用できる定量的データを含まないが、チロキシン濃度の低下とトリヨードチロニン濃度の上昇、及び関連する遺伝子の発現増加が報告されており、参考資料として区分 c とした。

表 4−6−3　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(生活環境動植物及び家畜に対する毒性、WOSCC)

文献番号	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
W059	II 8.2	Jia, M., *et al*.	2019	The effects of hexaconazole and epoxiconazole enantiomers on metabolic profile following exposure to zebrafish (*Danio rerio*) as well as the histopathological changes	Chemosphere Vol.226, 520-533 http://dx.doi.org/10.1016/j.chemosphere.2019.03.140	ヘキサコナゾール各異性体のゼブラフィッシュに対する生殖毒性を、主に病理組織学的に調査。リスク評価に直接活用できる定量的データを含まないが、参考資料として区分 c とした。
W060	II 8.2	Wang, Y., *et al*.	2015	Enantioselective bioaccumulation of hexaconazole and its toxic effects in adult zebrafish (*Danio rerio*)	Chemosphere Vol.138, 798-805 http://dx.doi.org/10.1016/j.chemosphere.2015.08.015	ゼブラフィッシュへの生体蓄積と代謝への影響に関する研究。異性体間で蓄積速度に差異があることが示されており、参考資料として区分 c とした。

表 4−6−4　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(環境動態、WOSCC)

文献番号	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
W071	II 7.2	Sharma, K., *et al*.	2013	Sorption and leaching behavior of hexaconazole as influenced by soil properties	Toxicological and Environmental Chemistry Vol.95-7, 1090-1098 http://dx.doi.org/10.1080/02772248.2013.860143	インドにおける 4 種類の土壌中の吸着・浸出動態研究。海外の土壌試料による研究であり日本の代表的な使用条件とは異なるが、4 種類の土壌の吸着係数が示されており、参考資料として区分 c とした。

表 4−6−4　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(環境動態、WOSCC)

文献番号	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
W072	II 8.10	Ju, C., *et al*.	2017	Effects of hexaconazole application on soil microbes community and nitrogen transformations in paddy soils	Science of The Total Environment Vol.609, 655-663 http://dx.doi.org/10.1016/j.scitotenv.2017.07.146	中国の水田土壌中の微生物への影響調査。 農薬の評価に直接活用できるエンドポイントを含まないが、ヘキサコナゾールの過剰施用が硝化細菌の活性低下を招く可能性を示唆しており、参考資料として区分 c とした。
W076	II 7.2	Zhang, Q., *et al*.	2015	Study on the stereoselective degradation of three triazole fungicides in sediment	Ecotoxicology and Environmental Safety Vol.117, 1-6 http://dx.doi.org/10.1016/j.ecoenv.2015.03.014	無処理の土壌及び無菌化土壌における、ヘキサコナゾールの異性体間の動態差異に関する研究。 微生物群集の寄与の程度が異性体間で異なる可能性が示唆されており、参考資料として区分 c とした。
W093	II 7.4.3	Fenoll, J., *et al*.	2010	Leaching potential of several insecticides and fungicides through disturbed clay-loam soil columns	International Journal of Environmental Analytical Chemistry Vol.90-44991, 276-285 http://dx.doi.org/10.1080/03067310902962544	スペインのこしょう農場を想定した 11 種類の農薬の室内カラムリーチング試験。 ヘキサコナゾールの比較的高い残存性が示されており、参考資料として区分 c とした。
W100	II 7.4.1	Suddaby, L.A., *et al*.	2016	Long-term experiments to investigate irreversibility in sorption of pesticides to soil	Chemosphere Vol.162, 40-47 http://dx.doi.org/10.1016/j.chemosphere.2016.07.062	長期間土壌吸着動態調査。 吸着係数や半減期等の一般的なパラメーターは示されていないが、56 日残留率が示されており、参考資料として区分 c とした。

5. 食品安全委員会における検討対象となるヒトに対する毒性に関する論文の一覧

「残留農薬の食品健康影響評価における公表文献の取扱いについて（令和 3 年 3 月 18 日 農薬第一専門調査会決定)」に基づき、食品安全委員会における検討対象となるヒトに対する毒性に関する論文の一覧を下記の通り別途添付する。

- 別添１　ヘキサコナゾール　食品安全委員会フォーマット表

6. 海外評価機関等の評価書に引用のある文献

「公表文献の収集、選択等のためのガイドライン（令和 3 年 9 月 22 日農薬資材審議会農薬分科会決定、令和 5 年 7 月 27 日一部改正)」に基づき、EU（EFSA)、米国（EPA）及び JMPR の評価書を調査したところ、JMPR に 1 件の評価書が認められたが、ヘキサコナゾールに関する公表文献の引用はなかった。

ヘキサコナゾールに関する評価書（JMPR）

Pesticide residues in food - 1990: toxicological evaluations

https://www.inchem.org/documents/jmpr/jmpmono/v90pr09.htm

EFSA 及び EPA においては、ヘキサコナゾールの評価は実施されていない。

7. 結果および結論

ヘキサコナゾールについて、系統的な文献調査を実施した。文献検索は Web of Science Core Collection（WOSCC）及び J-STAGE を用いて実施した。検索期間は 2009 年 1 月 1 日-2023 年 12 月 31 日とした。

WOSCC 検索においては、化合物名等と分類フィールド及び生物種等に関するキーワードによる掛け合わせ検索により 130 件の文献がヒットした。これら 130 件の文献に対して文献表題及び概要を基に第 1 段階の適合性評価を行い、58 件の文献を選抜した。さらにこの 58 件の文献について文献全文を用いた第 2 段階評価を実施して、28 件を適合性ありと判断した。

これら 28 件につき、評価目的への適合性分類（表 3−2−1）に基づき「区分 b」: ヒトに対する毒性 1 件､生活環境動植物及び家畜に対する毒性 1 件､「区分 c」: ヒトに対する毒性 14 件、農作物及び畜産物への残留 3 件、生活環境動植物及び家畜に対する毒性 4 件、環境動態 5 件に分類した。「区分 a」に該当する文献はなかった。

J-STAGE 検索においては、化合物名等とキーワード及び生物種等に関するキーワードによる掛け合わせ検索により 68 件の文献がヒットし、これら 68 件に第 1 段階の適合性評価を行って 11 件を選抜した。さらにこの 11 件の文献について第 2 段階の適合性評価を実施し、11 件すべてを適合性なしと判断した。このため、評価目的への適合性分類は実施しなかった。

海外の代表的な 3 評価機関（EFSA、USEPA、JMPR）による評価書を調査したところ、JMPR において 1 件の評価書が認められたが､ヘキサコナゾールに関する公表文献の引用はなかった。を EFSA 及び EPA ではヘキサコナゾールの評価は実施されていなかった。

食品安全委員会の「残留農薬の食品健康影響評価における公表文献の取扱いについて」に基づき、ヒトに対する毒性に関する文献のうち第 2 段階評価で適合性ありと判断した 15 件を検討対象として選抜し､「食品安全委員会フォーマット表」として別添した。疫学研究に関する文献には、検討対象と考えられるものはなかった。

別添

検討対象となる公表文献（疫学研究に関するもの以外）の一覧

No.	文献名	ジャーナル名等	公表年	著者名	著者の所属機関	書誌情報	研究分野	原著／総説	海外評価書での引用の有無	ドシエでの引用の有無	*in vivo* (動物種) */in vitro*	用量 (mg/kg体重又は mg/kg体重/日)	NOAEL／NOEL	LOAEL／LOEL	Klimisch コード	評価の目的との適合性に関する情報	備考
1 (W001)	Enantioselective degradation of hexaconazole in rat hepatic microsomes *in vitro*	Chirality, Vol.24-4, 283-288	2012	Zhang, P., *et al.*	China Agricultural University, China	http://dx.doi.org/10.1002/chir.21993	代謝	原著	無	無	*in vitro*	–	–	–	–	区分c　ラット肝ミクロソーム内におけるヘキサコナゾールの異性体間の半減期の代謝比較研究。 IC_{50}の差異（(＋)体：64.16μM、(-)体：34.20μM）等が示されている。	
2 (W002)	Gender-Related *In Vitro* Metabolism of Hexaconazole and Its Enantiomers in Rats	Chirality,Vol.25-12, 852-857	2013	Shen, Z.G., *et al.*	China Agricultural University, China	http://dx.doi.org/10.1002/chir.22225	代謝	原著	無	無	*in vitro*	–	–	–	–	区分c　ラット肝ミクロソームにおけるヘキサコナゾール代謝を調査。 異性体間及び雌雄間の反応速度の差異について言及している。	
3 (W003)	Hexaconazole exposure ravages biosynthesis pathway of steroid hormones: revealed by molecular dynamics and interaction	Toxicology Research, Vol.11-1, 60-76	2022	Abdi, S.A.H., *et al.*	Albaha University, Saudi Arabia	http://dx.doi.org/10.1093/toxres/tfab113	一般毒性	原著	無	無	–	–	–	–	–	区分c　分子動力学的シミュレーションにより、ヘキサコナゾールと6種類の主要酵素との相互作用機構を調査。 シュミレーションでありリスク評価に使用しない。	ヘキサコナゾールがステロイド生成経路の進行に関与する酵素の活性部位と強く結合することが見出され、ホルモン合成の破壊または強力な内分泌かく乱につながる可能性が示唆された。
4 (W004)	Enantioselective toxicity effect and mechanism of hexaconazole enantiomers to human breast cancer cells	Food and Chemical Toxicology, Vol.173	2023	Yang, N., *et al.*	Guizhou Medical University, China	http://dx.doi.org/10.1016/j.fct.2023.113612	一般毒性	原著	無	無	*in vitro*	–	–	–	–	区分c　ヒト乳がん細胞を用いた細胞毒性研究。 異性体間の毒性の差異と、その差異を生じるメカニズムについて考察されている。	
5 (W006)	Stereoselective Toxicokinetic and Distribution Study on the Hexaconazole Enantiomers in Mice	Toxics, Vol.11-2	2023	Luo, G.F., *et al.*	Guizhou Medical University, China	http://dx.doi.org/10.3390/toxics11020145	代謝	原著	無	無	*in vivo* (マウス)	0.2 mL/動物	–	–	–	区分c　マウスを用いたヘキサコナゾール異性体間の動態差異の研究。 S体とR体との間で半減期が異なることが臓器別に示されている。	
6 (W009)	The discovery of combined toxicity effects and mechanisms of hexaconazole and arsenic to mice based on untargeted metabolomics	Ecotoxicology and Environmental Safety, Vol.226	2021	Sun, D.L., *et al.*	Guizhou Medical University, China	http://dx.doi.org/10.1016/j.ecoenv.2021.112859	一般毒性	原著	無	無	*in vivo* (マウス)	200 mg/kg体重/日	–	–	–	区分c　ヘキサコナゾールの毒性にヒ素が与える影響に関する調査。 1用量のみで行われ、代謝物解析試験であるため、リスク評価に使用しないとし、区分cとした。	ヘキサコナゾール単体での投与も行われ、メタボロミクス解析により主として脂質関連の代謝への影響が示唆された。
7 (W010)	Factors Affecting the Bioaccessibility and Intestinal Transport of Difenoconazole, Hexaconazole, and Spirodiclofen in Human Caco-2 Cells Following in Vitro Digestion	JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY, Vol.65, 9139-9146	2017	Shi, Y.H., *et al.*	Anhui Agricultural University, China	http://dx.doi.org/10.1021/acs.jafc.7b02781	一般毒性	原著	無	無	*in vitro*	–	–	–	–	区分b ヒトの消化管経由での農薬摂取動態に関する*in vitro* 研究。リスク評価に直接活用できるエンドポイントを含まないが、ヘキサコナゾールの経口生体到達度（対MRL比）が示されている。	
8 (W015)	Studies on the interaction of five triazole fungicides with human renal transporters in cells	Toxicology In Vitro, Vol.88	2023	Nie, J., *et al.*	Zhejiang University, China	http://dx.doi.org/10.1016/j.tiv.2023.105555	一般毒性	原著	無	無	*in vitro*	–	–	–	–	区分c　5種類のトリアゾール系殺菌剤がヒト腎臓トランスポーターに与える影響に関する*in vitro* 研究。 ヘキサコナゾールが阻害するトランスポーターが特定されている。	
9 (W017)	Comparative cytotoxic effects of five commonly used triazole alcohol fungicides on human cells of different tissue types	Journal of Environmental Science and Health Part B Pesticides Food Contaminants and Agricultural Wastes, Vol.55-5, 438-446	2020	Xu, J.Y., *et al.*	East China University of Science and Technology, China	http://dx.doi.org/10.1080/03601234.2019.1709377	一般毒性	原著	無	無	*in vitro*	–	–	–	–	区分c　トリアゾール系殺菌剤が4種類のヒト由来細胞に与える影響を調査。 定性的データが主であり、ヘキサコナゾールの定量的データはHeLa細胞のIC_{50}> 100μMのみ。	
10 (W018)	Inhibitory effects of azole-type fungicides on interleukin-17 gene expression via retinoic acid receptor-related orphan receptors alpha and gamma	Toxicology and Applied Pharmacology, Vol.259-3, 338-345	2012	Kojima, H., *et al.*	Hokkaido Institute of Pubtic Heaith, Japan	http://dx.doi.org/10.1016/j.taap.2012.01.011	一般毒性	原著	無	無	*in vitro*	–	–	–	–	区分c　5種類のトリアゾール系殺菌剤がヒトの免疫系に与える影響に関する*in vitro* 研究。 免疫系に与える影響の機序が示唆されている。	
11 (W028)	Conazole fungicides inhibit Leydig cell testosterone secretion and androgen receptor activation *in vitro*	Toxicology Reports, Vol.1, 271-283	2014	Roelofs, M.J.E., *et al.*	Utrecht University, The Netherlands	http://dx.doi.org/10.1016/j.toxrep.2014.05.006	その他毒性	原著	無	無	*in vitro*	–	–	–	–	区分c　コナゾール系殺菌剤がアンドロゲン活性に与える影響に関する*in vitro* 研究。 濃度依存的なテストステロン分泌阻害が定量的データとして示されている（IC_{50}：23.2μM）。	
12 (W122)	Effects of triazole fungicides on androgenic disruption and CYP3A4 enzyme activity	Environmental Pollution, Vol.222, 504-512	2017	Lv, X., *et al.*	Zhejiang University, China	http://dx.doi.org/10.1016/j.envpol.2016.11.051	その他毒性	原著	無	無	*in vitro*	–	–	–	–	区分c　農薬5種類の内分泌かく乱作用の機序に関する研究。 各農薬の抗アンドロゲン活性とCYP3A4阻害能との間の高い相関が報告されている。	
13 (W208)	Monitoring tryptophan metabolism after exposure to hexaconazole and the enantioselective metabolism of hexaconazole in rat hepatocytes *in vitro*	Journal of Hazardous Materials, Vol.295, 9-16	2015	Wang, Y., *et al.*	China Agricultural University, China	http://dx.doi.org/10.1016/j.jhazmat.2015.04.006	代謝	原著	無	無	*in vitro*	–	–	–	–	区分c　ラット肝細胞の代謝能、細胞毒性等について、ヘキサコナゾールの異性体間の差異を調査。 異性体間の代謝能の差異がEC_{50}で示されている（ラセミ体：71.62μM、(＋)：62.71μM、(－)：67.94μM）。	

14 (W212)	Sub-chronic exposure to hexaconazole affects the lipid metabolism of rats through mTOR-PPAR-γ/SREBP1 signaling pathway mediated by oxidative stress	Pesticide Biochemistry and Physiology, Vol.197	2023	Sun, D.L., *et al.*	Guizhou Medical University, China	http://dx.doi.org/10.1016/j.pestbp.2023.105646	代謝	原著	無	無	*in vivo* (ラット)	0.1 及び 1 mg/kg体重/日	–	–	–	区分c　脂質代謝経路の応答を調査。ラット短期投与試験（2用量）において、脂質代謝経路の反応を確認した。NOAEL等のエンドポイントは示されておらず、リスク評価に使用しないとし、区分cとした。	
15 (W214)	Triazole fungicides exert neural differentiation alteration through H3K27 me3H3K27 me3 modifications: *In vitro* and *in silico* study	Journal of Hazardous Materials, Vol.459	2023	Ku, T.T., *et al.*	Shanxi University, China	http://dx.doi.org/10.1016/j.jhazmat.2023.132225	生殖発生	原著	無	無	*in vitro*	–	–	–	–	区分c　毒性機作の解明を目的としてマウス胚を用いた発生毒性研究。 神経発生に与える影響の作用機作が示唆されている。	

トリアゾール共通代謝物

公表文献調査結果について

令和 **6** 年 **9** 月 **19** 日
修正　令和 **7** 年 **1** 月 **22** 日

シンジェンタジャパン株式会社

1. 緒言

トリアゾール共通代謝物（1,2,4-トリアゾール、トリアゾール酢酸、トリアゾールアラニン及びトリアゾール乳酸）に関して、再評価資料提出期限の始期（2024 年 7 月 1 日）の 6 ヶ月前から過去 15 年間を含む期間に発行された公表文献について検索し、適合性及び信頼性の評価を行った。検索期間に応じ、以下の 3 報を提出する。Version 6 及び Version 7 は、EU の評価に用いるため提出済みの報告書である。Version 8 は、ヘキサコナゾールの日本における再評価申請のために追加検索を行い、Triazole Metabolite Derivative Group 作成の報告書について申請者により日本における評価に合わせて修正並びに追記を行ったものである。

- Literature Search Triazole Derivative Metabolites, Being Common Metabolites of Triazole-Fungicides, **Version 6**, 13th May 2019, Triazole Metabolite Derivative Group（EU 既提出）
  検索期間：2003 年 1 月 1 日～2019 年 4 月 10 日

- Literature Search Triazole Derivative Metabolites, Being Common Metabolites of Triazole-Fungicides, **Version 7**, 3rd July 2020, Triazole Metabolite Derivative Group（EU 既提出）
  検索期間：2019 年 4 月 10 日～2020 年 3 月 23 日

- Literature Search Triazole Derivative Metabolites, Being Common Metabolites of Triazole-Fungicides, **Version 8**, 10th July 2024, Triazole Metabolite Derivative Group content modified by Syngenta Japan K.K. for submission in Japan.（日本提出用追加検索分）
  検索期間：2020 年 3 月 23 日～2024 年 2 月 2 日

2. 検索結果のまとめ

検索をおこなった全期間（2003 年 1 月 1 日～2024 年 2 月 2 日）の調査結果のまとめを表 2-1～表 2-3 に示す。

表 2-1　データベース間の重複を除いた総論分数

	データベース間の重複を除いた総論分数			
検索分野	**Version 6**	**Version 7**	**Version 8**	**計**
物理化学的性状	817	25	199	**1041**
ヒトに対する毒性	1505	60	499	**2064**
農作物及び畜産物への残留	1227	52	368	**1647**
生活環境動植物及び家畜に対する毒性	625	13	129	**767**
環境動態	2071	89	542	**2702**
合計	**6245**	**239**	**1737**	**8221**

表 2-2　評価目的との適合性評価（第 1 段階）の結果のまとめ

	第 1 段階評価結果							
	適合性なし				それ以外（第 2 段階へ）			
検索分野	**Version 6**	**Version 7**	**Version 8**	**計**	**Version 6**	**Version 7**	**Version 8**	**計**
物理化学的性状	817	25	199	**1041**	0	0	0	**0**
ヒトに対する毒性	1501	60	497	**2058**	4	0	2	**6**
農作物及び畜産物への残留	1226	52	366	**1644**	1*	0	2	**3**
生活環境動植物及び家畜に対する毒性	623	13	126	**762**	2	0	3	**5**
環境動態	2071	88	533	**2692**	0	1	9	**10**
合計	**6238**	**238**	**1721**	**8197**	**7**	**1**	**16**	**24**

*Version 6（Table 9.3-1) に誤記があったため、修正した値を記載した。

表 2-3　評価目的との適合性評価（第 2 段階）の結果のまとめ

	第 2 段階評価結果							
	適合性なし				適合性あり			
検索分野	**Version 6**	**Version 7**	**Version 8**	**計**	**Version 6**	**Version 7**	**Version 8**	**計**
物理化学的性状	0	0	0	**0**	0	0	0	**0**
ヒトに対する毒性	4	0	2	**6**	0	0	0	**0**
農作物及び畜産物への残留	1	0	2	**3**	0	0	0	**0**
生活環境動植物及び家畜に対する毒性	2	0	3	**5**	0	0	0	**0**
環境動態	0	1	8	**9**	0	0	1	**1**
合計	**7**	**1**	**15**	**23**	**0**	**0**	**1**	**1**

3. 海外評価機関等の評価書に引用のある文献

「公表文献の収集、選択等のためのガイドライン（令和 3 年 9 月 22 日農薬資材審議会農薬分科会決定、令和 5 年 7 月 27 日一部改正）」に基づき、海外評価機関等の評価を調査したところ、JMPR に 3 件の文献引用が認められた。表 3-1 に示すとともに別添 1「食品安全委員会フォーマット表」に示した。

トリアゾール共通代謝物に関する評価書（JMPR）

Pesticide residues in food - 2008: toxicological evaluations

https://apps.who.int/pesticide-residues-jmpr-database/Document/114

表 3-1　EFSA、USEPA、JMPR の評価書に引用されている論文

リストNo.	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）
J001	II 5	Menegola, E., *et al.*	2001	Antifungal triazoles induce malformations in vitro.	Reproductive Toxicology 15, 421-427	JMPR	Pesticide residues in food - 2008: toxicological evaluations
J002	II 5	Wickings, E.J., *et al.*	1987	Non-steroidal inhibition of granulosa cell aromatase activity in vitro.	Journal of Steroid. Biochemistry 26, 641-646	JMPR	Pesticide residues in food - 2008: toxicological evaluations
J003	II 5	Wickramaratne, G A de S.	1987	The Chernoff-Kavlock assay: its validation and application in rats.	Teratogenesis, Carcinogenesis and Mutagenesis 7, 73–83	JMPR	Pesticide residues in food - 2008: toxicological evaluations

4. 結果及び結論

トリアゾール共通代謝物について文献調査を実施した。検索期間は 2003 年 1 月 1 日～2024 年 2 月 2 日とした。化合物名等で 5 つの検索分野（物理化学的性状、ヒトに対する毒性、農作物及び畜産物への残留、生活環境動植物及び家畜に対する毒性、環境動態）で 8221 件の文献がヒットした。これらの文献に対して文献表題及び要旨を基に第 1 段階の適合性評価を行い 24 件が検索された。この 24 件について文献全文を用いた第 2 段階評価を実施し、環境動態分野における 1 件を適合性あり（区分 c）と判断した。（ただし、日本における評価では、DA②の日本の代表的な使用方法／使用条件における評価に活用できないため、適合性なしと判断できる。）また、JMPR 評価書にヒトに対する毒性に関する文献の引用が 3 件認められたため別添 1「食品安全委員会フォーマット表」に示した。

以上

別添

検討対象となる公表文献（疫学研究に関するもの以外）の一覧

No.	文献名	ジャーナル名等	公表年	著者名	著者の所属機関	書誌情報	研究分野	原著／総説	海外評価書での引用の有無	ドシエでの引用の有無	*in vivo* (動物種) /*in vitro*	用量 (mg/kg体重 又は mg/kg体重/日)	NOAEL ／NOEL	LOAEL ／LOEL	Klimisch コード	評価の目的との適合性に関する情報	備考
1 (J001)	Antifungal triazoles induce malformations in vitro.	Reproductive Toxicology 15, 421-427	2001	Menegola, E., *et al.*	University of Milan, Italy	https://doi.org/10.1016/S0890-6238(01)00143-5	生殖発生	原著	JMPR	無	*in vitro* （ラット胚）	–	–	–	–	リスク評価に直接活用できるエンドポイントを含まないが、トリアゾール系代謝物が培養胚で催奇形性作用を示さないことが示唆された。 試験ガイドライン非準拠。	ラット培養胚を用いた催奇形性研究。
2 (J002)	Non-steroidal inhibition of granulosa cell aromatase activity in vitro.	Journal of Steroid. Biochemistry 26, 641-646	1987	Wickings, E.J., *et al.*	Institute of Obstetrics and Gynaecology, Hammersmith Hospital, UK	https://doi.org/10.1016/0022-4731(87)91035-1	生殖発生	原著	JMPR	無	*in vitro* （ラット卵巣細胞）	–	–	–	–	リスク評価に直接活用できるエンドポイントを含まないが、トリアゾール系代謝物が卵巣顆粒膜細胞で見かけ上のアロマターゼ阻害作用を示した。 試験ガイドライン非準拠。	ラット卵巣顆粒膜培養細胞におけるアロマターゼ阻害研究。
3 (J003)	The Chernoff-Kavlock assay: its validation and application in rats.	Teratogenesis, Carcinogenesis and Mutagenesis 7, 73–83	1987	Wickramaratne, G A de S.	Central Toxicology Laboratory, Imperial Chemical Industries PLC, UK	https://doi.org/10.1002/tcm.1770070110	生殖発生	原著	JMPR	無	*in vivo* (ラット)	25,100	催奇形性なし	–	–	被験物質に関する情報がなく、リスク評価に直接活用できるエンドポイントを含まない。Chernoff-Kavlockアッセイのバリデーションのため26種類の物質で検討。トリアゾールは催奇形性を有さない物質との結果。	ラット発生毒性試験10匹/群。

Document Title

Literature Search
Triazole Derivative Metabolites,
Being Common Metabolites of Triazole-Fungicides

Data Requirements

EU Regulation 1107/2009 & EU Regulation 283/2013
Document MCA
Section 9: Literature data

According to the Guidance Document SANCO/10181/2013, for preparing dossiers for the approval of a chemical active substance

Version 6

Date

13th May 2019

Owner

Triazole Metabolite Derivatives Group (TMDG)

BASF SE, Bayer AG, Dow AgroScience LLC,
Isagro S.p.A, Syngenta Crop Protection AG

OWNERSHIP STATEMENT

History

This Literature search is performed for and owned by the Triazole Derivatives Metabolite Group (TDMG), a task force consisting of five companies, BASF SE, Bayer CropScience AG, Dow AgroScience LLC Isagro S.p.A. and Syngenta Crop Protection AG. These five companies have interests in a number of parent triazole fungicide compounds. The parent triazoles have common metabolites and historically the companies have formed a cooperation to share data and avoid duplicate testing. The TDMG also license data to license holders particularly to avoid duplicate animal testing. As of 2018, Dupont is also a member under the auspices of the merger with Dow.

This Literature search was initially run in Jan 2014 and then has been updated in Jun 2015, Nov 2015, Jan 2016, Aug 2016, Mar 2018, December 2018 and Apr 2019.

Date of search 1	10th January 2014
Date span of the search 1	2003 to 9th January 2014
Date of search 2	10th June 2015
Date span of the search 2	10th January 2014 – 9th June 2015
Date of search 3	19th November 2015
Date span of the search 3	10th June 2015 – 18th November 2015
Date of search 4	20th January 2016
Date span of the search 4	19th November 2015 – 20th January 2016
Date of search 5	15th August 2016
Date span of the search 5	20th January 2016 – 15th August 2016
Date of search 6	19th March 2018
Date span of the search 6	15th August 2016 – 19th March 2018
Date of search 7	7th December 2018
Date span of the search 7	20th March – 7th December 2018
Date of search 8	10th April 2019
Date span of the search 8	8th December 2018 – 10th April 2019

This document has been previously submitted to support the review of TDMG parent triazole active substances in various EU Member States as detailed below.

Date	**Parent Triazole Submission**	**RMS**
July 2014	Propiconazole	Finland
Oct 2015	Metconazole	Belgium / UK
Oct 2015	Triticonazole	Austria / UK

Jan 2016	Prothioconazole	UK / France
Mar 2016	Mefentrifluconazole	UK / France
June 2016	Difenconazole	Spain / UK
February 2017	Tebuconazole Triadimenol	
June 2019	Tetraconazole Penconazole	

Table of Contents

CA 9 LITERATURE DATA

CA 9.1 Title

This document is a Literature Review Report for the four common triazole derived metabolites (1,2,4-triazole, triazole acetic acid, triazole alanine and triazole lactic acid) with data packages belonging to the Triazole Derivatives Metabolite Group (TDMG).

CA 9.2 Author(s) of the review

[redacted], Consultant to the TDMG and Syngenta on behalf of the Triazole Derivatives Metabolite Group (TDMG), Jealott's Hill International Research Centre, Bracknell, Berkshire RG42 6EY, UK and Bayer AG, Monheim Germany.

CA 9.3 Summary: A brief summary indicating the purpose of the report, the methodology employed and the results obtained

This report summarises the search for "scientific peer-reviewed open" literature on the four common triazole metabolites 1,2,4-triazole, triazole acetic acid, triazole alanine and triazole lactic acid dealing with the following sections of the dossier, product chemistry properties, toxicology, metabolism and residues data, ecotoxicology and environmental fate data which may impact health, the environment and non-target species and published within the last ten years before the date of submission of the " parent triazole active dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

The exact search strategy is detailed in the Appendix but a summary of the methodology employed is given below and a summary of the results are also presented.

1. Dossier section by section, a very broad search was conducted in up to 16 scientific source databases (detailed in Appendix 2) for 1,2,4-triazole, triazole acetic acid, triazole alanine and triazole lactic acid using the search terms listed in Appendix 1.
2. Duplicate titles from between the data bases were automatically removed from the output.
3. A rapid assessment of the titles was conducted to remove any additional duplicates and any obviously irrelevant titles (where enough information was available from the title alone).
4. A further rapid assessment was conducted using summary abstracts and any clearly irrelevant titles were removed.
5. A detailed assessment of the full-text documents for the remaining titles was conducted using the criteria developed for study relevance.
6. Any relevant papers were highlighted and assessed for reliability.

Table 9.3-1: Results of study selection process

An overview of the Product Chemistry properties results is summarised in the tables below.

Data requirement(s) captured in the search	Search 1	Search 2	Search 3	Search 4	Search 5
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	406	116	57	10	56
Number of *summary records* excluded from the search results after rapid assessment for relevance	406	116	57	10	56
Total number of *full-text* documents assessed in detail*	0	0	0	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature

Data requirement(s) captured in the search	Search 6	Search 7	Search 8		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	151	13	8		
Number of *summary records* excluded from the search results after rapid assessment for relevance	151	13	8		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature

An overview of the Toxicology results is summarised in the tables below.

Data requirement(s) captured in the search	Search 1	Search 2	Search 3	Search 4	Search 5
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	791	219	98	17	66
Number of *summary records* excluded from the search results after rapid assessment for relevance	791	219	98	13	66
Total number of *full-text* documents assessed in detail*	0	0	0	4	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0	4	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature

Data requirement(s) captured in the search	**Search 6**	**Search 7**	**Search 8**		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	261	37	16		
Number of *summary records* excluded from the search results after rapid assessment for relevance	261	37	16		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature

An overview of the Metabolism and Residues results is summarised in the tables below.

Data requirement(s) captured in the search	**Search 1**	**Search 2**	**Search 3**	**Search 4**	**Search 5**
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	600	172	84	14	54
Number of *summary records* excluded from the search results after rapid assessment for relevance	599	172	84	14	54
Total number of *full-text* documents assessed in detail*	1	0	0	0	1
Number of *studies* excluded from further consideration after detailed assessment for relevance**	1	0	0	0	1
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Data requirement(s) captured in the search	**Search 6**	**Search 7**	**Search 8**		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	224	66	13		
Number of *summary records* excluded from the search results after rapid assessment for relevance	224	66	13		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance**	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

An overview of the Ecotoxicology results is summarised in the table below.

Data requirement(s) captured in the search	**Search 1**	**Search 2**	**Search 3**	**Search 4**	**Search 5**
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	324	91	28	6	29
Number of *summary records* excluded from the search results after rapid assessment for relevance**	323	91	28	6	29
Total number of *full-text* documents assessed in detail*	1	0	0	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	1	0	0	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Data requirement(s) captured in the search	**Search 6**	**Search 7**	**Search 8**		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	133	9	5		
Number of *summary records* excluded from the search results after rapid assessment for relevance**	133	9	5		
Total number of *full-text* documents assessed in detail*	0	1	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	1	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

An overview of the Environmental Fate results is summarised in the table below.

Data requirement(s) captured in the search	**Search 1**	**Search 2**	**Search 3**	**Search 4**	**Search 5**
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	1095	283	167	22	95
Number of *summary records* excluded from the search results after rapid assessment for relevance**	1095	283	167	22	95
Total number of *full-text* documents assessed in detail*	0	0	0	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Data requirement(s) captured in the search	**Search 6**	**Search 7**	**Search 8**		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	348	43	18		
Number of *summary records* excluded from the search results after rapid assessment for relevance**	348	43	18		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

CA 9.4 Protocol

CA 9.4.1 Statement of the objective of the review

The review has the objective of identifying "scientific peer-reviewed open literature on 1,2,4-triazole, triazole acetic acid, triazole alanine and triazole lactic acid dealing with product chemistry, toxicology, metabolism and residue studies, ecotoxicology and environmental fate which may impact health, the environment and non-target species and published within the last ten years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009.

CA 9.4.2 Criteria for relevance with which decisions to select studies in the dossier were made

The list of criteria of relevance are summarised in Appendix 1, covering each section of the dossier individually. This is because each section has slightly different criteria applying.

CA 9.5 Search methods

Date of search 1	10th January 2014
Date span of the search 1	2003 to 9th January 2014
Date of search 2	10th June 2015
Date span of the search 2	10th January 2014 – 9th June 2015
Date of search 3	19th November 2015
Date span of the search 3	10th June 2015 – 18th November 2015
Date of search 4	20th January 2016
Date span of the search 4	19th November 2015 – 20th January 2016
Date of search 5	15th August 2016
Date span of the search 5	20th January 2016 – 15th August 2016
Date of search 6	19th March 2018
Date span of the search 6	15th August 2016 – 19th March 2018
Date of search 7	7th December 2018
Date span of the search 7	20th March – 7th December 2018
Date of search 8	10th April 2019
Date span of the search 8	8th December 2018 – 10th April 2019

Detailed Search Parameters – Search Terms for each section of the dossier are listed individually in Appendix 2.

CA 9.6 Results

Table 9.6-1: Results of the Product Chemistry study selection process

Data requirement(s) captured in the search	Search 1	Search 2	Search 3	Search 4	Search 5
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	406	116	57	10	56
Number of *summary records* excluded from the search results after rapid assessment for relevance	406	116	57	10	56
Total number of *full-text* documents assessed in detail*	0	0	0	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature

Data requirement(s) captured in the search	Search 6	Search 7	Search 8		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	151	13	8		
Number of *summary records* excluded from the search results after rapid assessment for relevance	151	13	8		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature

In the Product Chemistry search, all records were excluded as being non-relevant.

Table 9.6-2: Results of the Toxicology study selection process

Data requirement(s) captured in the search	Search 1	Search 2	Search 3	Search 4	Search 5
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	791	219	98	17	66
Number of *summary records* excluded from the search results after rapid assessment for relevance	791	219	98	13	66
Total number of *full-text* documents assessed in detail*	0	0	0	4	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0	4	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature

Data requirement(s) captured in the search	Search 6	Search 7	Search 8		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	261	37	16		
Number of *summary records* excluded from the search results after rapid assessment for relevance	261	37	16		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature

For the initial rapid assessment, study titles were scanned to identify the relevance of studies for mammalian toxicology. Studies dismissed immediately included those clearly not related to toxicology and those unambiguously belonging to another section (ecotoxicology, residue data).

In some cases the title did not provide sufficient information to dismiss the reference and in these cases the abstract was checked to confirm whether the full paper should be reviewed. In search 4, 4 abstracts were further reviewed and deemed not relevant. Details are presented below.

Following the study selection process, it was concluded that there were no relevant studies which required further assessment or evaluation.

From Search 4, Reference to the paper by author and by data point and are given in Tables 9.6-2.1 and 9.6-2.2. Details of why this paper has been excluded for relevance or reliability are given in Table 9.6-2.3.

Table 9.6-2.1: List of references for all relevant and unclear studies listed by data point number

CA data point number	Author(s)	Year	Title	Source
CA 5.8.2	Kamboj Vipan K; Verma Prabhakar K; Dhanda Anu; Ranjan Sudhir	2015	1,2,4-triazole derivatives as potential scaffold for anticonvulsant activity	Central nervous system agents in medicinal chemistry, (2015) Vol. 15, No. 1, pp. 17-22. Journal code: 101269163. E-ISSN: 1875-6166. L-ISSN: 1871-5249.
CA 5.8.2	Kumar, Basavapatna; Mohana, Kikkeri; Mallesha, Lingappa	2013	Synthesis and antiproliferative activity of some new fluorinated Schiff bases derived from 1,2,4-triazoles	Journal of Fluorine Chemistry [J. Fluorine Chem.]. Vol. 156, pp. 15-20. 1 Dec 2013. ISSN: 0022-1139 DOI: 10.1016/j.jfluchem.2013.08.008 Published by: Elsevier B.V. URL (Document): http://www.sciencedirect.com/science/article/pii/S0022113913002947
CA 5.8.2	Plech Tomasz; Kapron Barbara; Paneth Agata; Kosikowska Urszula; Malm Anna; Strzelczyk Aleksandra; StAczek Pawel; SwiAtek Lukasz; Rajtar Barbara; Polz-Dacewicz Malgorzata	2015	Determination of the primary molecular target of 1,2,4-triazole-ciprofloxacin hybrids	Molecules (Basel, Switzerland), (2015) Vol. 20, No. 4, pp. 6254-72. Electronic Publication Date: 9 Apr 2015. Journal code: 100964009. E-ISSN: 1420-3049. L-ISSN: 1420-3049
CA 5.8.2	Wang, Bing; Chu, Daniel; Feng, Ying; Shen, Yuqiao; Aoyagi-Scharber, Mika; Post, Leonard E.	2016	Discovery and Characterization of (8S,9R)-5-Fluoro-8-(4-fluorophenyl)-9-(1- methyl-1H-1,2,4-triazol-5-yl)-2,7,8,9-tetrahydro-3H-pyrido[4,3,2- de]phthalazin-3-one (BMN 673, Talazoparib), a Novel, Highly Potent, and Orally Efficacious Poly(ADP-ribose) Polymerase-1/2 Inhibitor, as an Anticancer Agent	Journal of Medicinal Chemistry, (2016) Vol. 59, No. 1, pp. 335-357. CODEN: JMCMAR. ISSN: 0022-2623.

Table 9.6-2.2: List of references for all relevant and unclear studies listed by Author

Author(s)	Year	CA data point number	Title	Source
Kamboj Vipan K; Verma Prabhakar K; Dhanda Anu; Ranjan Sudhir	2015	CA 5.8.2	1,2,4-triazole derivatives as potential scaffold for anticonvulsant activity	Central nervous system agents in medicinal chemistry, (2015) Vol. 15, No. 1, pp. 17-22. Journal code: 101269163. E-ISSN: 1875-6166. L-ISSN: 1871-5249.
Kumar, Basavapatna; Mohana, Kikkeri; Mallesha, Lingappa	2013	CA 5.8.2	Synthesis and antiproliferative activity of some new fluorinated Schiff bases derived from 1,2,4-triazoles	Journal of Fluorine Chemistry [J. Fluorine Chem.]. Vol. 156, pp. 15-20. 1 Dec 2013. ISSN: 0022-1139 DOI: 10.1016/j.jfluchem.2013.08.008 Published by: Elsevier B.V. URL (Document): http://www.sciencedirect.com/science/article/pii/S0022113913002947

Author(s)	Year	CA data point number	Title	Source
Plech Tomasz; Kapron Barbara; Paneth Agata; Kosikowska Urszula; Malm Anna; Strzelczyk Aleksandra; StAczek Pawel; SwiAtek Lukasz; Rajtar Barbara; Polz-Dacewicz Malgorzata	2015	CA 5.8.2	Determination of the primary molecular target of 1,2,4-triazole-ciprofloxacin hybrids	Molecules (Basel, Switzerland), (2015) Vol. 20, No. 4, pp. 6254-72. Electronic Publication Date: 9 Apr 2015. Journal code: 100964009. E-ISSN: 1420-3049. L-ISSN: 1420-3049
Wang, Bing; Chu, Daniel; Feng, Ying; Shen, Yuqiao; Aoyagi-Scharber, Mika; Post, Leonard E.	2016	CA 5.8.2	Discovery and Characterization of (8S,9R)-5-Fluoro-8-(4-fluorophenyl)-9-(1- methyl-1H-1,2,4-triazol-5-yl)-2,7,8,9-tetrahydro-3H-pyrido[4,3,2-de]phthalazin-3-one (BMN 673, Talazoparib), a Novel, Highly Potent, and Orally Efficacious Poly(ADP-ribose) Polymerase-1/2 Inhibitor, as an Anticancer Agent	Journal of Medicinal Chemistry, (2016) Vol. 59, No. 1, pp. 335-357. CODEN: JMCMAR. ISSN: 0022-2623.

A detailed review of the full-text documents identified in Table 9.6-3.3 resulted in the additional exclusion of the following study from the dossier.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 5.8.2	Kamboj Vipan K; Verma Prabhakar K; Dhanda Anu; Ranjan Sudhir	2015	1,2,4-triazole derivatives as potential scaffold for anticonvulsant activity	Central nervous system agents in medicinal chemistry, (2015) Vol. 15, No. 1, pp. 17-22. Journal code: 101269163. E-ISSN: 1875-6166. L-ISSN: 1871-5249.	Considered not relevant as no new data are presented and does not change our understanding of 1,2,4-triazole.
CA 5.8.2	Kumar, Basavapatna; Mohana, Kikkeri; Mallesha, Lingappa	2013	Synthesis and antiproliferative activity of some new fluorinated Schiff bases derived from 1,2,4-triazoles	Journal of Fluorine Chemistry [J. Fluorine Chem.]. Vol. 156, pp. 15-20. 1 Dec 2013. ISSN: 0022-1139 DOI: 10.1016/j.jfluchem.2013.08.008 Published by: Elsevier B.V. URL (Document): http://www.sciencedirect.com/science/article/pii/S0022113913002947	Considered not relevant as no new data are presented and does not change our understanding of 1,2,4-triazole.

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
CA 5.8.2	Plech Tomasz; Kapron Barbara; Paneth Agata; Kosikowska Urszula; Malm Anna; Strzelczyk Aleksandra; StAczek Pawel; SwiAtek Lukasz; Rajtar Barbara; Polz-Dacewicz Malgorzata	2015	Determination of the primary molecular target of 1,2,4-triazole-ciprofloxacin hybrids	Molecules (Basel, Switzerland), (2015) Vol. 20, No. 4, pp. 6254-72. Electronic Publication Date: 9 Apr 2015. Journal code: 100964009. E-ISSN: 1420-3049. L-ISSN: 1420-3049	Considered not relevant as no new data are presented and does not change our understanding of 1,2,4-triazole.
CA 5.8.2	Wang, Bing; Chu, Daniel; Feng, Ying; Shen, Yuqiao; Aoyagi-Scharber, Mika; Post, Leonard E.	2016	Discovery and Characterization of (8S,9R)-5-Fluoro-8-(4-fluorophenyl)-9-(1- methyl-1H-1,2,4-triazol-5-yl)-2,7,8,9-tetrahydro-3H-pyrido[4,3,2-de]phthalazin-3-one (BMN 673, Talazoparib), a Novel, Highly Potent, and Orally Efficacious Poly(ADP-ribose) Polymerase-1/2 Inhibitor, as an Anticancer Agent	Journal of Medicinal Chemistry, (2016) Vol. 59, No. 1, pp. 335-357. CODEN: JMCMAR. ISSN: 0022-2623.	Considered not relevant as no new data are presented and does not change our understanding.

Table 9.6-3: Results of Metabolism and Residue study selection process

Data requirement(s) captured in the search	Search 1	Search 2	Search 3	Search 4	Search 5
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	600	172	84	14	54
Number of *summary records* excluded from the search results after rapid assessment for relevance**	599	172	84	14	54
Total number of *full-text* documents assessed in detail*	1	0	0	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	1	0	0	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Data requirement(s) captured in the search	Search 6	Search 7	Search 8		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	224	66	13		
Number of *summary records* excluded from the search results after rapid assessment for relevance**	224	66	13		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Following exclusion of references from the rapid assessment, the full text was assessed from the 1 remaining paper resulted in it being identified as not relevant and therefore this title could be excluded.

Full details of this paper are given in the tables below.

Reference to the paper by author and by data point and are given in Tables 9.6-3.1 and 9.6-3.2. Details of why this paper has been excluded for relevance or reliability are given in Table 9.6-3.3.

Table 9.6-3.1: List of references for all relevant and unclear studies listed by data point number

CA data point number	Author(s)	Year	Title	Source
6.5.3	Lennon SF, Reighard GL, Schermerhorn P, Podhorniak L, Horton D	2006	Profiling Presence and Concentration of Eighteen Pesticide Residues through a Commercial Canning Process	Acta Horticulturae 713, 409-416

Table 9.6-3.2: List of references for all relevant and unclear studies listed by Author

Author(s)	Year	CA data point number	Title	Source
Lennon SF, Reighard GL, Schermerhorn P, Podhorniak L, Horton D	2006	6.5.3	Profiling Presence and Concentration of Eighteen Pesticide Residues through a Commercial Canning Process	Acta Horticulturae 713, 409-416

A detailed review of the full-text documents identified in Table 9.6-3.3 resulted in the additional exclusion of the following study from the dossier.

Table 9.6-3.3: List of references excluded following detailed review listed by data point number

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier
6.5.3	Lennon SF, Reighard GL, Schermerhorn P, Podhorniak L, Horton D	2006	Profiling Presence and Concentration of Eighteen Pesticide Residues through a Commercial Canning Process	Acta Horticulturae 713, 409-416	The aim of this study was to investigate the fate of pesticides, including 1,2,4-triazole, triazole alanine and triazole acetic acid, during the canning of peaches. Samples of peaches were sourced from commercial growers. No residues of 1,2,4-triazole were detected in whole, peeled or canned peaches. Residues of triazole alanine and triazole acetic acid were identified in all commodities and showed a decline of over 75% from the whole peaches into canned peaches. This paper is not considered relevant because - There is no record of the treatment the peaches received in the field - The levels of triazole alanine and triazole acetic acid reported in canned peaches are 7.6 and 3.7 ppb respectively which are below the validated limit of quantification of the method (25 ppb) - These results show a significant reduction in residues during processing. Since the TDMG dietary risk assessment for the triazole metabolites assumes no reduction in residues on processing of any crop commodity, and demonstrates large margins of safety, this paper is not required to refine the risk assessment

Table 9.6-4: Results of Ecotoxicology study selection process

Data requirement(s) captured in the search	Search 1	Search 2	Search 3	Search 4	Search 5
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	324	91	28	6	29
Number of *summary records* excluded from the search results after rapid assessment for relevance	323	91	28	6	29
Total number of *full-text* documents assessed in detail*	1	0	0	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance**	1	0	0	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Data requirement(s) captured in the search	Search 6	Search 7	Search 8		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	133	9	5		
Number of *summary records* excluded from the search results after rapid assessment for relevance	133	9	5		
Total number of *full-text* documents assessed in detail*	0	1	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance**	0	1	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Following exclusion of references from the rapid assessment, the remaining study titles were scanned to identify whether the studies were indeed relevant to ecotoxicology or not – for example, any studies clearly not in the remit of the European review (such as studies about Brazilian species); or unambiguously belonging to other sections such as environmental fate or efficacy (the majority of the references found), were excluded. There are now two papers where the full text was assessed and resulted in being identified as not relevant and therefore both titles could also be excluded.

Reference to the papers by author and by data point and are given in Tables 9.6-4.1 and 9.6-4.2. Details of why these papers have been excluded for relevance or reliability are given in Table 9.6-4.3.

Table 9.6-4.1: List of references for all relevant and unclear studies listed by data point number

CA data point number	Author(s)	Year	Title	Source	Ref. ID
CA 8.2.6	Ambrožová, Jana; Macák, Jan	2006	The influence of anti-corrosion compounds on algal growth	Algological Studies, Volume 120, Number 1, July 2006, pp. 107-113	310
CA 8.10	El Azhari N, Dermou E, Barnard R L, Stork V, Tourna M, Beguet J, Karas P A, Lucini L, Rouard N, Botteri L, Ferrari F, Trevisan M, Karpouzas D G, Martin-Laurent F.	2018	The dissipation and microbial ecotoxicity of tebuconazole and its transformation products in soil under standard laboratory and simulated winter conditions	The Science of the Total Environement Vol.637-638, pp 892-906	

Table 9.6-4.2: List of references for all relevant and unclear studies listed by Author

Author(s)	Year	CA data point number	Title	Source	Ref. ID
Ambrožová, Jana; Macák, Jan	2006	CA 8.2.6	The influence of anti-corrosion compounds on algal growth	Algological Studies, Volume 120, Number 1, July 2006, pp. 107-113	310
El Azhari N, Dermou E, Barnard R L, Stork V, Tourna M, Beguet J, Karas P A, Lucini L, Rouard N, Botteri L, Ferrari F, Trevisan M, Karpouzas D G, Martin-Laurent F.	2018	CA 8.10	The dissipation and microbial ecotoxicity of tebuconazole and its transformation products in soil under standard laboratory and simulated winter conditions	The Science of the Total Environement Vol.637-638, pp 892-906	

A detailed review of the full-text documents identified in Table 9.6-4.3 resulted in the additional exclusion of the following stuiesy from the dossier as non-relevant.

Table 9.6-4.3: List of references excluded following detailed review listed by data point number

CA data point number	Author(s)	Year	Title	Source	Reason(s) for not including the study in the dossier	Ref. ID
CA 8.2.6	Ambrožová, Jana; Macák, Jan	2006	The influence of anti-corrosion compounds on algal growth	Algological Studies, Volume 120, Number 1, July 2006, pp. 107-113	Does not meet criterion 1 (poorly defined test item). No analytical verification of test item concentrations. Study also fails to meet criteria 9 and 10, as there is insufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust, and the study did not follow a recommended protocol. The study duration was 192 hr, considerably longer than the more typical duration of 72 or 96 hr, for green algae.	310
CA 8.10	El Azhari N, Dermou E, Barnard R L, Stork V, Tourna M, Beguet J, Karas P A, Lucini L, Rouard N, Botteri L, Ferrari F, Trevisan M, Karpouzas D G, Martin-Laurent F.	2018	The dissipation and microbial ecotoxicity of tebuconazole and its transformation products in soil under standard laboratory and simulated winter conditions	The Science of the Total Environement Vol.637-638, pp 892-906	The aim of this study was to investigate the dissipation and microbial toxicity of the parent triazole fungicide tebuconazole. Breakdown metabolites were detected and identified. There was no correlation between the metabolites and ecotoxicology of the triazole metabolites of relevance. This paper is not considered relevant because any effects on soil microorganisms cannot be clearly attributed to triazole metabolites (which are observed, but at levels below the LoQ). In addition, they were seen in control samples as well as in the test formulation samples.	

Table 9.6-5: Results of Environmental Fate study selection process

Data requirement(s) captured in the search	Search 1	Search 2	Search 3	Search 4	Search 5
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	1095	283	167	22	95
Number of *summary records* excluded from the search results after rapid assessment for relevance	1095	283	167	22	95
Total number of *full-text* documents assessed in detail*	0	0	0	0	0
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0	0	0
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

*both from bibliographic databases and other sources of peer-reviewed literature

Data requirement(s) captured in the search	Search 6	Search 7	Search 8		
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	348	43	18		
Number of *summary records* excluded from the search results after rapid assessment for relevance	348	43	18		
Total number of *full-text* documents assessed in detail*	0	0	0		
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0		
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0		

*both from bibliographic databases and other sources of peer-reviewed literature

Following the study selection process, it was concluded that there were no relevant studies which required further assessment or evaluation.

Overall Conclusion of Results

No relevant studies or papers were found from all the searches performed on the common triazole metabolites to date. Those papers warranting further attention were examined in detail and also assessed to be non-relevant.
Copies of non-relevant papers can be supplied on request.

Appendix 1 Criteria for relevance

Appendix 1.1: List of Criteria for relevance for Product Chemistry studies

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
Physical and chemical properties (CA 2.1 to 2.15)	1. Well defined test material (including purity/content) 2. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods, and appropriate sampling regime). 3. Study conditions should not differ significantly from recommended protocols* and internationally agreed tests methods (CIPAC MT and OECD methods). 4. Study conditions should not interfere with the interpretation of the study results. 5. End-points or positions stated as a result of the study significantly affect the proposed risk assessment in the dossier.

Table Appendix 1.2: List of Criteria for relevance for toxicological and toxicokinetic studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
*CA 5.1 ADME studies	1. Well identified test material including purity and impurity profile 2. Relevant test species e.g. rodent – rat/mouse – non-rodent – dog 3. Relevant endpoint e.g. ADME measurement or metabolite identification 4. Well described condition of the test and quantitative assessment of results to substantiate and evaluate whether the study conclusions and endpoints are robust
*CA 5.2 Acute toxicity	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rats and mice, rabbit, guinea pig 3. Relevant route of administration for risk assessment 4. Describe observations, examinations, analyses performed or necropsy 5. Different outcome to those studies currently reported
*CA 5.4 Genotoxicity	1. Well identified test material including purity and impurity profile 2. Relevant cell line or species used 3. "validated" or widely used test method 4. In vitro observation not addressed by in vivo data (including tissue specific effects) 5. In vivo effect in somatic or germs cells in relevant species 6. Relevant route of exposure to test substance 7. Contradicts submitted studies, impacts WoE. 8. Recognised methods for scoring studies outcomes used where applicable
*CA 5.3, 5.5, 5.6, 5.7, 5.8.1 Short term, chronic, reproductive and neurotoxicity, studies on metabolites	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rodents rats and mice, non- rodent dog is preferred 3. Sufficient number of animals per group to establish statistical significance 4. Test several dose levels (minimum 3) 5. Relevant route of administration for risk assessment 6. Include negative control (preferable) 7. Establish dose response 8. Describe observations, examinations, analyses performed or necropsy 9. Contradicts submitted studies and/or changes key endpoints

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
CA 5.8.2 Supplementary studies on the active substance	1. Identified test material 2. Unusual routes of exposure acceptable as they may introduce important information on other possible toxicological effects 3. Regulatory use usually limited to addressing species sensitivity /safety factors etc. 4. Examples of studies a. Effects of combined exposures b. Hormonal effects (if not guideline studies or included in 5.8.3) c. Hypersensitivity of specific sub-populations d. Gender and age variation in susceptibility (if not included in 5.6 Reproductive studies) e. Mode of action investigations
CA 5.8.3 Endocrine disrupting properties	1. Identified test material 2. All studies considered relevant at this stage – need to be checked for reliability
CA 5.9 Medical data (including epidemiology) CP 7.2 to 7.4	1. Identified test material 2. All records considered relevant at this stage - need to be checked for reliability

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1.3: List of Criteria for relevance for Metabolism and Residues

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
Metabolism and residues data (CA 6.1 to 6.9)	
Summary	The relevance criteria applied to determine whether a literature reference was relevant for the residues and metabolism sections of the active substance renewal process are given below. 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species. e.g. is the crop a representative use; were relevant animal commodities used? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. did the study meet the relevant guidelines? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. was the compound used previously at the trial site; was the animal feed free from the compound? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 6. Validated Analytical methodology employed. e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given? 7. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.1 Storage Stability of Residues (plant and animal)	Storage Stability Studies 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species. e.g. is the crop a representative use; were relevant animal commodities used?

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. did the study meet the relevant guidelines and GAP? 4. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 5. Validated analytical methodology employed e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given? 6. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.2 Metabolism, distribution and Expression of Residues (plant and animal) **CA 6.6.2 Metabolism and Distribution in Succeeding Crops**	1. Well defined test material. e.g. if radiolabelled material was used, was an appropriate isotope used? 2. Applicable test species. e.g. ruminant, poultry, etc.? 3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. is the application rate relevant and equivalent to maximum seasonal rate on rotated crops? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. is plot history supplied? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. Were metabolites identified by appropriate techniques? 6. Validated analytical methodology employed. e.g. were representative clear chromatograms provided to support metabolite identification? 7. Study conditions do not interfere with the interpretation of the study results. e.g. if the test item is photolabile was the study conducted outdoors?
CA 6.3 Magnitude of Residues Trials in Plants	Published monitoring reports were not considered relevant due to the fact that it would not be possible to determine whether or not a misuse scenario had resulted in the residue levels reported. <u>Crop Studies</u> 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. 7. Study conditions should not interfere with the interpretation of the study results. <u>Notes for above criteria</u> 1. Well defined test material (including purity/content) e.g. was the formulation comparable to the proposed representative formulation? 2. Applicable test species e.g. is it a representative use crop? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Is the GAP relevant? Correct rate, application method, interval, PHI, spray volume, BBCH (if applicable), region, indoor/outdoor, control samples taken? e.g. were weather details available?

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	e.g. were the control plots well separated from treated plots? e.g. was the field phase conducted according to GLP? e.g. were samples stored deep frozen? Were appropriate numbers of samples taken, e.g. 2kg of apples? e.g. was appropriate sampling methodology employed? Was the sample handling traceable? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. Plot history supplied, e.g. evidence that compound not used that year or previous year, and information on other plant protection products (e.g. to check for common metabolites). 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above and also, have they proposed an endpoint, e.g. MRL, what statistical methods have they used for this? 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Was a validated method used, were acceptable recoveries obtained, were control samples analysed, were control samples 'clean', were representative clear chromatograms provided, Was the analytical phase conducted according to GLP? Were all components of the residue definition analysed for? Were samples analysed within a time period covered by storage stability data?
CA 6.4 Livestock Feeding Studies	Same criteria as for crop studies, examples could be as above with the following additions. <u>Livestock Feeding Studies Notes</u> 1. Well defined test material (including purity/content) 2. Applicable test species e.g. Ruminant, poultry, pig, fish, any edible animal. 3. Study conditions should not differ significantly from recommended protocols. e.g. is the dosing level extreme? e.g. was the application form appropriate, e.g. capsule? e.g. was the number of test species correct, e.g. three cows, nine hens? e.g. was the dosing period appropriate, e.g. minimum 28 days? e.g. were control animals included? e.g. were the animals healthy? e.g. were the animals acclimatized? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. is it clear that additional animal feed did not contain treated substance? 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.
CA 6.5 Effects of Processing	<u>High Temperature Hydrolysis</u> 1. Well defined test material (including purity/content) e.g. if radiolabelled test item was used, was an appropriate isotope used (e.g.

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	^{14}C and not ^{3}H)? e.g. if radiolabelled test item was used, was the labelling position(s) appropriate to capture potential metabolites? e.g. if radiolabelled test item was used, was the specific activity adequate to meet an LOQ of 0.01 mg/kg? N.B. If water solubility of test item is < 0.01 mg/L then no study is required and can be deemed non-relevant 2. Applicable test system e.g. Was the test undertaken in a sterilised buffer medium? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Were the temperature and pH conditions applied typical of processing operations carried out on commodities relevant to the test item? e.g. were samples stored deep frozen? 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above e.g. Were metabolites identified by appropriate techniques (e.g. co-chromatography with known standards using two dissimilar chromatographic systems or by techniques capable of positive structural identification e.g. MS, NMR)? 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Were relevant control experiments carried out when harsher techniques (e.g. acid/base hydrolysis) were used to identify metabolites (i.e. to ensure metabolites identified are not merely artefacts)? e.g. were representative clear chromatograms provided to support metabolite identification? e.g. where sample analysis exceeded 6 months from sample collection was storage stability of samples demonstrated? 7. Study conditions should not interfere with the interpretation of the study results. Field Studies 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.
CA 6.6 Residues in Rotational crops	Same criteria as for crop residue studies, examples could be subtly different, e.g. acceptable PBIs, crop types, again monitoring information should not be considered relevant.
CA 6.7 Proposed residue definition and MRLs	Residue definition would only be affected if data generated in another section, e.g. metabolism/tox. MRLs would only be affected if residues generated and this is covered under 6.3.
CA 6.8 Proposed Safety Intervals	Not required. Any animal safety reports that might affect withholding periods would

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	be covered in the review of literature in the Toxicology Section.
CA 6.9 Risk Assessment	Not required – any adverse findings for the risk assessment will have to be due to a data point from one of the other sections, and are therefore covered in other sections of this document.
CA 6.10 Other Studies	Not required.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1.4: List of Criteria for relevance for Ecotoxicology studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Ecotoxicological studies (CA 8.1 to 8.9)	Laboratory Studies 6. Well defined test material (including purity/content) 7. Number of organisms per group sufficient to establish a statistical significance 8. Applicable test species 9. Test organisms are not previously exposed to the test material or other contaminants 10. Several dose levels tested, at least 3, including a negative control, to establish a dose-response, unless the study design is specifically a limit test. Control must be run concurrently with treatments and mortality to be within test validity criteria. 11. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 12. If conducted, analytical confirmation of dosing or sufficient information provided to determine concentrations were within acceptable range (e.g. 80-120%) of nominal targets. 13. Effects are related to single test item, and a quantitative relationship exists between the reported endpoint and risk assessment endpoints of growth, mortality, behaviour and/or reproduction. 14. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 15. Study conditions should not differ significantly from recommended protocols. 16. Study conditions should not interfere with the interpretation of the study results. Field Studies 17. Appropriate and relevant geoclimatic conditions (setting), appropriate application method and rates (exposure) and observation data (biological relevance) to derive endpoints. 18. Well defined test material (including purity/content) 19. Applicable test species 20. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 21. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods and appropriate sampling regime). 22. Study conditions should not differ significantly from recommended protocols, if available for field study. Study conditions should not interfere with the interpretation of the study results

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1.5: List of Criteria for relevance for Environmental Fate

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Route and rate of degradation in soil – Laboratory Studies – aerobic and anaerobic, parent and metabolites CA 7.1.1 CA 7.1.1.1 CA 7.1.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 307) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols e.g. temperature and moisture 6. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 7. Sufficient number of samples taken to determine kinetics (minimum 5) 8. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 9. Analytical method well described, LOD/LOQ at appropriate level 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 11. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 12. Identification of 'new' metabolites is robust with appropriate details of method used 13. Anaerobic conditions are verified by measurement
Route and rate of degradation in soil – Field Studies CA 7.1.2.2	1. In addition to criteria under laboratory route and rate: 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate weather data available to verify relevance of study 4. Application technique relevant to proposed use (foliar, ST granule etc) 5. Sufficient sampling detail and description of sample handling prior to analysis 6. Initial and procedural recoveries are adequate to support the conclusions, e.g. 70-120%.
Soil photolysis CA 7.1.1.3	In addition to criteria under laboratory route and rate: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Mobility studies Adsorption, desorption – parent and metabolites CA 7.1.3 Column or TLC leaching CA 7.1.4.1.1, CA 7.1.4.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 106) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols 6. Application rate is appropriate to the proposed use and can be verified from the data 7. Sufficient number of samples taken to determine isotherm (if done) 8. Stability of the test item in the system was demonstrated 9. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 10. Mass balance or recovery for radiolabelled and unlabelled studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	respectively is adequate to support the conclusions, e.g. >90% 11. Analytical method well described, LOD/LOQ at appropriate level 12. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Lysimeter studies CA 7.1.4.2	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data available to verify relevance of study. Combined rainfall/irrigation sufficient to meet guideline requirements 3. Minimum 1 m depth soil monolith 4. Study continued for sufficient years to support the conclusions
Field leaching CA 7.1.4.3.	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data and groundwater data (depth, direction) available to verify the validity of study 3. Installation and operation of lysimeters and/or wells and samplers follows recommended protocols 4. Study continued for sufficient years to support the conclusions
Hydrolysis CA 7.2.1	1. Well defined test material (including purity/content) 2. Experimental conditions should not differ significantly from recommended protocols 3. Application rate is within an acceptable the range (e.g. consider solubility) and can be verified from the data (time zero samples) 4. Sufficient number of samples taken to determine kinetics (minimum 5) 5. Analytical method well described, LOD/LOQ at appropriate level 6. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 7. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 8. Identification of 'new' metabolites is robust with appropriate details of method used
Aqueous photolysis CA 7.2.1.2	In addition to criteria under hydrolysis: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Degradation in aquatic systems CA 7.2.2	1. Well defined test material (including purity/content) 2. Water(s) and sediment(s) must be from an agricultural area and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 308) 3. Water/sediment collection, preparation and storage do not differ significantly from recommended protocols 4. Experimental conditions do not differ significantly from recommended protocols e.g. temperature and aeration 5. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 6. Sufficient number of samples taken to determine kinetics (minimum 5) 7. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 8. Analytical method well described, LOD/LOQ at appropriate level 9. Analytical method appears robust with suitable reproducibility and

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Identification of 'new' metabolites is robust with appropriate details of method used 12. Anaerobic conditions are verified by measurement
Degradation in the saturated zone CA 7.2.3	1. For laboratory studies refer to criteria under laboratory route and rate 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate site characterisation data available e.g. soils, geology, hydrology 4. Installation of samplers e.g. wells, lysimeters follows recommended protocols 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Route and rate of degradation in air CA 7.3.1	1. Experimental conditions or calculations differ significantly from recommended protocols 2. Analytical method well described, LOD/LOQ at appropriate level 3. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Monitoring CA 7.5	1. Site(s) or areas must be geoclimatically relevant for the EU 2. Adequate site characterisation data available e.g. soils, geology, hydrology 3. Installation of samplers e.g. wells, lysimeters follows recommended protocols OR adequate description of wells is available (depth of well, length of screen, depth of screen opening, depth of groundwater) 4. Appropriate sampling methodology. 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. suitable blank controls included 7. For surface water: description of sampling methodology and handling of detects (peaks, interpolated time-step?), linked to rainfall intensity and volume). Discharge volumes, catchment drained area.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Appendix 2 Detailed Search Parameters for each named Dossier section

Appendix 2.1 Product Chemistry

Table 2.1.1: Detailed Search Parameters for Product Chemistry studies (CA 2.1 to 2.15)

Search Strategy
Chemical Names: 1,2,4-Triazole (CAS: 288-88-0) Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (((VAPOUR OR VAPOR)(3A)PRESSURE?) OR SOLUBILITY?) L2 QUE ((PARTITION(3A)COEFF?) OR EXPLOSIV? OR OXIDI!ING?) L3 QUE (OXIDI!ED? OR FLAMMAB? OR (FLASH(3A)POINT?)) L4 QUE (VOLATIL? OR VISCOS? OR VISCOUS? OR (LOG(W)KOW)) L5 QUE (VAPORI!AT? OR VAPOURI!AT? OR VAPOR!ED? OR VAPOURI!ED?) L6 QUE ((SPECIFIC(3A)GRAVITY?) OR ((MELTING OR BOILING)(2W)POINT)) L7 QUE (EVAPORAT? OR DENSITY OR LOGP OR (LOG(W)P) OR KOC) L8 QUE ((DIFFUSION(3A)COEFF?) OR (DISSOCI?(3A)CONSTANT?)) L9 QUE (ANTIINFLAMM? OR ANTIIGNIT? OR IGNIT? OR COMBUST?) L10 QUE ((L1 OR L2 OR L3) OR (L4 OR L5 OR L6) OR (L7 OR L8 OR L9))

Table 2.1.2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.	
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)	
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.	
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.	
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.	
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.	

Provider	Database	Justification	Limits applied
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily	
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.	
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)	
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.	
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly	
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.	

Provider	Database	Justification	Limits applied
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly. (Searches 1-5 only)	
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.	
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.	

* Total number of summary records retrieved after removing duplicates

Table 2.1.3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.1.4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.1.5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.2 Toxicology

Table 2.2.1: Detailed Search Parameters for Toxicological and Toxicokinetic studies (CA 5.1 to 5.9)

Search Strategy
Chemical Names: 1,2,4-Triazole (CAS: 288-88-0) Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (MUTAG? OR CANCER? OR TERATO? OR GENETOX? OR CARCIN?) L2 QUE (TUMOUR? OR TUMOR? OR CYTOTOX? OR GENOTOX? OR MELANOM?) L3 QUE (NEUROTOXI? OR LD50 OR IC50 OR ((LD OR IC)(W)50)) L4 QUE (((LONG OR SHORT)(W)TERM?)(L)(EFFECT? OR STUD? OR TOXIC?)) L5 QUE (ENDOCRIN? OR INHALAT? OR IRRITAT? OR REPROTOX?) L6 QUE (PERCUTANEOU? OR DERMAL? OR ORAL? OR INTOXICAT? OR INGEST?) L7 QUE (((REPRODUCT? OR EMBRYO? OR FOET? OR DEVELOP?)(5A)TOXI?)) L8 QUE ((ACUTE? OR CHRONIC?)(5A)(EFFECT? OR TOXIC? OR TOXIN#)) L9 QUE (GIRL# OR CHILD OR CHILDREN OR PATIENT# OR HUMAN# OR MAN) L10 QUE (MEN OR WOM!N OR BOY# OR WORKER# OR OPERATOR# OR FARMER#) L11 QUE (APPLICATOR# OR PERSONNEL? OR WORKFORCE OR EMPLOYEE#) L12 QUE (MAMMAL? OR RODENT# OR RAT OR RATS OR MOUSE OR MICE) L13 QUE (ACCIDENT? OR POISON? OR ALLERG? OR EXPOSURE? OR EXPOSE#) L14 QUE (OCCUPAT? OR EPIDEMIOL? OR SENSITIZ? OR SENSITIS?) L15 QUE ((HEALTH OR ADVERSE)(5A)(EFFECT# OR RISK#)) L16 QUE (MEDICAL OR (FIRST(W)AID) OR (TOXIC?(3A)STUD?) OR THERAPE?) L17 QUE (TOXICOKINETIC# OR EXTRACTAB? OR (RADIO(W)LABEL?)) L18 QUE (DOG# OR (GUINEA(W)PIG#) OR RABBIT# OR SKIN? OR EYE#) L19 QUE (HAND# OR DERMAL? OR BYSTANDER# OR RESIDENT#) L20 QUE ((ROTAT? OR SUCCEDING OR FOLLOWING)(3A)CROP#) L21 QUE ((DIETARY OR CONSUM? OR CUMULAT? OR AGGREGAT?)(5A)RISK?)

Search Strategy	
L22	QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21)
L2	QUE SPE=ON ABB=ON PLU=ON ABNORMAL BEHAVIOUR OR ABORTION OR ACCEPTABLE DIETARY INTAKE OR ACCEPTABLE OPERATOR EXPOSURE LEVEL OR ACUTE DERMAL APPLICATION OR ACUTE DERMAL TOXICITY OR ACUTE EFFECT OR ACUTE EXPOSURE OR ACUTE ORAL TOXICITY OR ACUTE REFERENCE DOSE
L3	QUE SPE=ON ABB=ON PLU=ON ACUTE TOXICITY OR ADDITIVE TOXICITY OR ADULT MORTALITY OR ADVERSE EFFECT OR ADVERSE EVENT OR AERIAL EXPOSURE OR AIR BLAST OR AIRBLAST OR ANORMAL BEHAVIOUR OR ASSESSMENT(1W)RISK OR AVERSIVE RESPONSE OR BBA MODEL OR BEHAVIOUR
L4	QUE SPE=ON ABB=ON PLU=ON BEHAVIOURAL ANOMALIES OR BIO MONITORING OR BIOMONITORING OR BIRTH RATE OR BODY ORGANS OR BODY WEIGHT OR BREEDING LOSS OR BYSTANDER OR CARCINOGEN OR CARCINOGENIC OR CARCINOGENICITY OR CHANGE (1W) BODY WEIGHT OR CHEMOSIS OR CHRONIC CONCERN
L5	QUE SPE=ON ABB=ON PLU=ON CHRONIC EFFECT OR CHRONIC STUDY OR CHRONIC TEST OR CHRONIC TOX OR CHRONIC TOXICITY OR CHRONIC TOXICOLOGICAL STUDY OR CLASTOGENICITY OR CLINICAL SIGN OR CLINICAL SYMPTOM OR CONJUNCTIVAE OR CONJUNCTIVAL CHEMOSIS OR CONJUNCTIVAL SAC
L6	QUE SPE=ON ABB=ON PLU=ON CONSTIPATIO OR CONSUMER OR CONTACT TOXICITY OR CORNEA OR CORNEAL OPACITY OR CREATININE OR CROP INSPECTION OR CYTOPLASMIC CHANGES(1W)HEPATOCYTES OR DAMAGE TO EYES OR DEAD EMBRYO OR DEAD FETUS OR DEAD PUP OR DEATH OR DECREASE(1W)BODY LENGTH
L7	QUE SPE=ON ABB=ON PLU=ON DERMAL OR DEVELOPMENTAL TOXICITY OR DIARRHEA OR DIE OR DIED OR DIETARY EXPOSURE OR DIETARY INTAKE OR DIETARY TOXICITY OR DIPPING OR DISLODGEABLE FOLIAR RESIDUE OR DISORIENTING OR DISTURBANCE(1W)VIABILITY OR DOG OR DUST DRIFT
L8	QUE SPE=ON ABB=ON PLU=ON EFFECT(1W)(BODY WEIGHT OR FOOD CONSUMPTION OR BODY ORGAN) OR EMBRYO OR EMBRYOPATHY OR EMBRYOTOX OR ENDOCRINE(W)DISRUPT? OR ENDOCRINE MODULATION OR ENGINEERING CONTROL OR EPIDEMIOLOGICAL OR EPIDEMIOLOGY OR ERYTHEMA
L9	QUE SPE=ON ABB=ON PLU=ON ESCHAR OR EUROPOEM OR EXPOSE OR EXPOSURE OR EYE IRRITATION OR FECUNDITY OR FEEDING STUDY OR FERTILITY RATE OR FETOTOX OR FETOTOXICOLOGICAL OR FETOTOXICOLOGY OR FOETAL CROWN-RUMP LENGTH OR FOETAL DEVELOPMENT OR FOGGING OR FOLIAR DEPOSITION
L10	QUE SPE=ON ABB=ON PLU=ON FOLIAR DISLODGEABLE RESIDUE OR GAIN(1W)BODY WEIGHT OR GASTROINTESTINAL OR GENOTOX OR GENOTOXIC OR GENOTOXICITY OR GENOTOXICOLOGICAL OR GESTATION OR GROUND BOOM OR GROUNDBOOM OR GUINEA PIG OR HAIR LOSS OR HAND TO MOUTH OR HANDHELD OR HAND-HELD
L11	QUE SPE=ON ABB=ON PLU=ON HAZARD OR HEALTH RISK OR HEPATOTOXIN OR HERSHBERGER ASSAY OR HUMAN EXPOSURE OR HUMAN HEALTH OR HUMAN MONITORING OR IMMUNOTOXICITY OR IMPLANTATION LOSS OR INCREASE (1W) LIVER WEIGHT OR INDURATION (2W) SKIN OR INFERTILITY
L12	QUE SPE=ON ABB=ON PLU=ON INHALATION OR INHALATORY ABSORPTION OR INHALATORY EXPOSURE OR INHALATORY RISK OR INTOXICATION OR INTRAPERITONEAL OR INTRAVENOUS OR INTRAVENOUSLY OR IRRITANT OR IRRITATING (1W)SKIN OR IRRITATION OR IRRITATION (2W)(IRIS OR SKIN)
L13	QUE SPE=ON ABB=ON PLU=ON KNAPSACK OR LABORED BREATHING OR LACERATION (2W) SKIN OR LACTATION OR LC50 OR LD50 OR LIGHT-COLO

Search Strategy	
	RED FECES OR LITTER SIZE OR LITTER WEIGHT OR LIVER OR LIVING PUPS OR LOCAL LYMPH NODE OR LONG-TERM EXPOSURE OR LONGTERM STUDY OR LONG-TERM STUDY
L14	QUE SPE=ON ABB=ON PLU=ON LONGTERM TOXICOLOGICAL OR LONG-TERM TOXICOLOGICAL OR LOSS (1W)(BODY WEIGHT OR HAIR) OR MALFORMATIO N OR MAMMAL OR MAMMALIAN OR MARGIN (1W) SAFETY OR MATERNAL TOXICITY OR MATING BEHAVIOUR OR MEDICAL DATA OR METABOLIC PATH OR METABOLIC PATHWAY
L15	QUE SPE=ON ABB=ON PLU=ON MONKEY OR MORTALITY OR MOUSE OR MRL EXCEEDANCE OR MRL VIOLATION OR MULTIGENERATION OR MUTAGEN OR MUTAGENIC OR MUTAGENICITY OR NECROPSY OR NEUROTOXIC OR NEUROTOXICITY OR NO OBSERVED ADVERSE EFFECT LEVEL OR NO OBSERVED EFFECT LEVEL
L16	QUE SPE=ON ABB=ON PLU=ON NOAEL SUBCHRONIC DOG OR NON DIETARY EXPOSURE OR NON-DIETARY EXPOSURE OR NO-OBSERVED ADVERSE EFFECT LEVEL OR NURSING OR OBJECT TO MOUTH OR OCCUPATIO NAL EXPOSURE OR OEDEMA OR OFFSPRING OR OPACITY OR OPERATOR OR ORAL ABSORPTION OR ORAL TOXICITY
L17	QUE SPE=ON ABB=ON PLU=ON ORALLY OR OVULATION OR PARENTERAL OR PARTURITION OR PASSIVE DOSIMETRY OR PATHOLOGICAL OR PATHOLOGY OR PATIENT OR PEELING (1W) SKIN OR PENETRATION FACTOR OR PERCUTANEOUS OR PERSONAL PROTECTIVE EQUIPMENT OR PHOTOTOXICITY OR PILOERECTION
L18	QUE SPE=ON ABB=ON PLU=ON PLACENTAL WEIGHT OR POISON OR POISONING OR POST-MORTEM EXAMINATIONS OR POSTNATAL OR POST-NATA L OR PREGNANCY OR PREGNANT OR PREMATURE BIRTH OR PRENATAL TOX OR PRENATAL TOXICOLOGY OR PRIMATE OR PROTECTIVE CLOTHING OR PROTECTIVE GARMENT
L19	QUE SPE=ON ABB=ON PLU=ON PROTECTIVE GLOVE OR PUBLIC HEALTH OR RABBIT OR RAT OR RE ENTRY OR REDDENING (1W) TREATMENT AREA OR REDNESS OR REDUCED BODY WEIGHT OR REDUCED BODY WEIGHT GAIN OR REENTRY OR RE-ENTRY OR REFERENCE DOSE OR RELEVANT (2W) REPRODUCTIVE SUCCESS
L20	QUE SPE=ON ABB=ON PLU=ON REPRODUCTION OR REPRODUCTIVE OR REPROTOX OR RESIDENT OR RESIDENTIAL EXPOSURE OR RESIDUE IN OR RESPIRATORY EXPOSURE OR RESPIRATORY PROTECTIVE EQUIPMENT OR RISK ASSESSMENT OR RISK (2W) (CONSUMER OR OPERATOR) OR SEXUAL
L21	QUE SPE=ON ABB=ON PLU=ON RISK (1W) SERIOUS DAMAGE (1W) EYES OR SAFE OR SAFETY OR SAFETY ASSESSMENT OR SAFETY PRECAUTION OR SECONDARY EFFECT OR SECONDARY POISONING OR SEEDTROPEX OR SENSITISATION BY SKIN CONTACT OR SENSITISER OR SENSITISING TESTS OR SENSITIZER
L22	QUE SPE=ON ABB=ON PLU=ON SHORT LONG TERM EXPOSURE OR SHORT-TERM EXPOSURE OR SHORT-TERM TOXICITY OR SHORT-TERM TOXICOLOGICAL OR SIDE EFFECT OR SIGNS (1W)(AGGRESSION OR TOXICITY) OR SKIN IRRITANT OR SKIN IRRITATION OR SKIN SENSITISA TION OR SKIN SENSITISING
L23	QUE SPE=ON ABB=ON PLU=ON SKIN SENSITIZATION OR SKIN SENSITIZING OR SLIGHTLY HARMFUL OR SPASTIC GAIT OR SPERMATOGENE SIS OR SPLEEN OR SPRAY DRIFT OR STOMACH LESIONS OR STUNTED FETUS OR SUBACUTE OR SUB-ACUTE OR SUBCHRONIC OR SUB-CHRONIC OR SUBLETHAL OR SUB-LETHAL
L24	QUE SPE=ON ABB=ON PLU=ON SUBSTANCE-RELATED EFFECT OR SURVIVAL OR SYMPTOMS (1W) TOXICITY OR SYSTEMIC EXPOSURE OR SYSTEMIC INTOLERANCE REACTIONS OR TERATOGEN OR TERATOGENIC OR TERATOGENICITY OR TERATOLOGY OR TESTICULAR DEVELOPMENT
L25	QUE SPE=ON ABB=ON PLU=ON ACTIVE INGREDIENTS (1W) SAFE OR (COMPOUND OR COMPOSITION OR FUNGICIDE OR INSECTICIDE OR PESTICIDE) (1W)SAFE OR THEORETICAL TOXICITY OR TOPICAL OR TOTAL DIET STUDY OR TOX OR TOXIC OR TOXICITY OR TOXICOGENOMIC OR TOXICOKINETICS OR TOXICOL
L26	QUE SPE=ON ABB=ON PLU=ON TOXICOLOGICAL OR TOXICOLOGY OR

Search Strategy	
	TRACTOR MOUNTED OR TRANSDERMAL OR TRANSFER COEFFICIENT OR TRANSFERABLE RESIDUES OR TREATMENT RELATED EFFECTS OR TUMORIGEN OR TUNNEL TEST OR TWO-GENERATION OR UNACCEPTABLE EFFECTS OR UTEROTROPHIC ASSAY
L27	QUE SPE=ON ABB=ON PLU=ON VERTEBRATE OR VIABILITY (1W) EMBRYO OR WEANING OR WEIGHT ALTERATION OR WEIGHTS OR WHOLE BODY DOSIMETER OR WHOLE BODY DOSIMETRY OR WORKER

Table 2.2.2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.	
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)	
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.	
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.	

Provider	Database	Justification	Limits applied
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.	
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.	
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily	
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.	
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)	
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.	

Provider	Database	Justification	Limits applied
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly	
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.	
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (Searches 1-5 only).	
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.	
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.	

* Total number of summary records retrieved after removing duplicates

Table 2.2.3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.2.4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.2.5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.3 Metabolism and Residues

Table 2.3.1: Detailed Search Parameters for Metabolism and Residues data – Search Terms

Search Strategy
Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole PLUS L1 QUE (METABOL? OR RESIDUE# OR TRANSFORM? OR BIOTRANSFORM?) L2 QUE (DEGRAD? OR BIODEGRAD? OR FATE# OR MRL OR MRLS) L3 QUE (CONJUGAT? OR EXCRET? OR ELIMINAT?) L4 QUE (FOOD# OR FEED# OR DIET# OR DIETARY OR CONSUMER? OR HUMAN#) L5 QUE (CONTAMINAT? OR SAFE? OR EXPOS? OR ANALY? OR ASSES?) L6 QUE (INTAKE? OR (IN(W)TAKE?) OR SURVEY? OR RISK?) L7 QUE (TOXIC? OR STUDY? OR STUDIES?) L8 QUE (L4(10A)(L5 OR L6 OR L7)) L9 QUE (LIVESTOCK# OR COW# OR GOAT# OR CATTLE# OR BULLOCK#) L10 QUE (BOVINE? OR BOVIDAE? OR BOS OR BULL# OR HEIFER? OR CAPRA#) L11 QUE (SHEEP# OR EWE OR EWES OR RAM# OR SWINE# OR PIGLET#) L12 QUE (PIG# OR SUIDAE? OR SUS OR OVIS OR OX OR OXEN) L13 QUE (RUMINANT? OR HEN# OR CHICKEN# OR FOWL# OR TURKEY?) L14 QUE (DUCK# OR GOOSE OR GEESE OR CAPON# OR POULTRY?) L15 QUE (MEAT OR MILK OR EGG# OR TISSUE#) L16 QUE (((BROKEN? OR BREAK?)(W)(DOWN OR UP)) OR BREAKDOWN?) L17 QUE (BREAKSDOWN? OR UPTAKE? OR PROCESSING? OR BOUND?) L18 QUE ((NON(W)EXTRACTAB?) OR (ROTATIONAL(3A)CROP#)) L19 QUE ((L1 OR L2 OR L3) OR L8 OR (L9 OR L10 OR L11 OR L12 OR L13 OR L14) OR (L15 OR L16 OR L17 OR L18))

Table 2.3-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number *
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	10 years	856 (600, 172, 84)
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		

Provider	Database	Justification	Limits applied	Number *
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly. (Searches 1-5 only)		
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		

* Total number of summary records retrieved after removing duplicates – numbers in parentheses are the summary records retrieved in the initial search and then
the 1st and 2nd top-up respectively)

Table 2.3-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.3-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.3-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.4 Ecotoxicology

Table 2.4.1: Detailed Search Parameters for Ecotoxicological studies (CA 8.1 to 8.9)

Search Strategy	
L1	**QUE (288-88-0 OR 1450828-63-3 OR 28711-29-7 OR 333354-47-5)**
L2	**QUE (86362-20-1 OR 114419-45-3 OR 4819-36-7)**
L3	**QUE (1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID)**
L4	**QUE (1(W)2(W)4(W)TRIAZOLE(W)1(W)ACETIC(W)ACID)**
L5	**QUE (1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID)**
L6	**QUE (2(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)**
L7	**QUE (2(2W)1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)**
L8	**QUE ((1H(2W)1(W)2(W)4(W)TRIAZOLE) OR (S(W)TRIAZOLE))**
L9	**QUE ((3(W)4(W)DIAZAPYRROLE) OR (4H(2W)1(W)2(W)4(W)TRIAZOLE))**
L10	**QUE (25167-73-1 OR 27236-77-7 OR 116421-29-5 OR 1001118-18-8)**
L11	**QUE (3(2W)1H(W)1(W)2(W)4(W)TRIAZOL#(W)1(W)YL(W)ALANINE)**
L12	**QUE (1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPANOIC(W)ACID)**
L13	**QUE (1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPIONIC(W)ACID)**
L14	**QUE ((2(W)HYDROXY(W)3)(2W)(L12 OR L13))**
L15	**QUE ((ALPHA(W)(HYDROXY OR AMINO))(3A)(L12 OR L13))**
L16	**QUE (L1-11 OR L14-15)**
	PLUS
L1	QUE (RIPARIAN? OR REPTILE? OR SNAKE? OR LIZARD?)
L2	QUE (TORTOISE? OR TURTLE? OR TERRAPIN? OR CROCODIL?)
L3	QUE (ALLIGATOR? OR CAIMAN? OR GHARIAL? OR HOVERFLIES)
L4	QUE ((MEADOW#(W)VOLE#) OR PSEUDOKIRSCHNERIELLA)
L5	QUE (RHAPHIDOCELIS OR NITZSCHIA OR CYCLOTELLA OR MICROCYSTIS)

Search Strategy		
L6	QUE	(OSCILLATORIA OR APHANIZOMENON OR ANKISTRODESMUS)
L7	QUE	(TEILINGRIA OR MONORAPHIDIUM OR RADIOCOCCACAE OR TETRASPORALES)
L8	QUE	(TETRAEDRON OR TREUBARIA OR WILLEA OR COSMOCLADIUM)
L9	QUE	(HYPOASPIS OR (SOIL(3A)MICROORGAN?) OR ECHINOCHLOA OR SPARTINA)
L10	QUE	(SALVINIA OR NAJAS OR CALLITRICHE OR MYOSOTIS OR STRATIOTES)
L11	QUE	(HIPPURUS OR PERSICARIA OR CLOEON? OR CORBICULA?)
L12	QUE	(NEOCARIDINIA? OR NEOCARIDINA? OR MYSID? OR CICHLIDAE)
L13	QUE	(CICHLID# OR LEPOMIS? OR SERRANIDAE OR PERCIFORMES)
L14	QUE	(ICTALURUS? OR POECILIA? OR ORYZIAS? OR GASTEROSTEUS?)
L15	QUE	(GASTEROSTEIDAE OR SALVELINUS OR BRACHYDANIO? OR CARASSIUS?)
L16	QUE	(MISGUMUS? OR CYPRINODON? OR FUNDULUS? OR MISGURNUS?)
L17	QUE	(BREAM OR ROTIFER# OR GAMMARUS OR GAMMARID? OR MAYFLY?)
L18	QUE	(BIVALVE# OR MUSSEL# OR MOLLUSK# OR MOLLUSC# OR BUFO)
L19	QUE	(NEWT# OR SCALLOP# OR CLAM# OR GAMBUSIA OR OREOCHROMIS)
L20	QUE	(OSTRAC? OR TUBIFEX? OR TURBELLARIA OR COPEPODA)
L21	QUE	(PREDACE? OR PREDACI? OR PARASITOID? OR APIS OR APIDAE)
L22	QUE	(BOMBUS OR BOMBINAE OR WORM# OR LUMBRICIDAE OR LUMBRICUS)
L23	QUE	(ALLOBOPHORA? OR DENDROBAENA? OR APORRECTODEA? OR DENDRODRILUS?)
L24	QUE	(EISENIA? OR OCTOLASION? OR (LACE(W)WING#) OR NEUROPTER?)
L25	QUE	(CARABID? OR CARBUS OR STAPHYLINID? OR COCCINEL? OR ADALIA?)
L26	QUE	(STETHORUS? OR SCYMNUS? OR WASP# OR VESPIDAE OR SPHECOIDEA)
L27	QUE	(SPHECIDAE OR STIZIDAE OR OPIUS OR (ICHNEUMON(W)FL?))
L28	QUE	(ICHNEUMONID? OR BRACONID? OR CHALCID? OR CYNIP? OR APHIDI?)
L29	QUE	(EUCOILID? OR IBALIID? OR FIGITID? OR EURYTOM? OR TORYM?)
L30	QUE	(ORYM? OR EUCHARIT? OR PERILAMP? OR PTEROMAL? OR CHRYSOLAMP?)
L31	QUE	(EUPELM? OR ENCYRT? OR SIGNIPHOR? OR APHELIN? OR ELASMID?)
L32	QUE	(ELASMUS OR TETRACAMP? OR MYMAR? OR HELOR? OR PROCTOTRUP?)
L33	QUE	(DIAPRI? OR SCELION? OR PLATYGASTR? OR PLATYGASTER?)
L34	QUE	(CERAPHRON? OR MEGASPIL? OR ARANE? OR OPILION? OR PHALANG?)
L35	QUE	(ARACHNID? OR HARVESTM? OR DADDYLONGLEG? OR (DADDY(W)LONG(W)LEG?))
L36	QUE	((DADDY(W)LONGLEG?) OR COLLEMB? OR (SPRING(W)TAIL?) OR CYDNODROMUS?)
L37	QUE	(PARDOSA? OR ORIUS? OR TYPHLODROM? OR PHYTOSEIULUS? OR SYRPHID?)
L38	QUE	(METASYRPHUS? OR SYRPHUS? OR EUPEODES? OR EPISYRPHUS? OR SYRPHIAN?)
L39	QUE	(EPISTROPHE? OR AMBLYSEIUS? OR POECILUS? OR TRECHUS? OR BEMBIDION?)
L40	QUE	(NEBRIA? OR PTEROSTICHUS? OR CALOSOMA? OR TACHYPORUS? OR NABIDAE?)
L41	QUE	(GEOCORIS? OR HYMENOPT? OR HAEMATOLOECHA? OR CHRYSOPID?

Search Strategy

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OR
                    SYMPHYTA?)
L42             QUE  (OULEMA? OR APHYTIS? OR BATHYPLECTES? OR LINPHIIDAE? OR
                    LYNPHIIDAE?)
L43             QUE  (LINYPHIIDAE? OR ERIGONE? OR BATHYPHANTES? OR MEIONETA?
OR
                    OEDOTHORAX?)
L44             QUE  (LEPTHYPHANTES? OR LYCOSID? OR LYCOSA? OR CHRYSOPA? OR
DACNUSA?)
L45             QUE  (CYRTORHINUS? OR CRYPTOLAEMUS? OR ZETZELLIA? OR
LEPTOMASTIX?)
L46             QUE  (TRICHOGRAMMA? OR ENCARSIA? OR MACROLOPHUS? OR
CHRYSOPERLA?)
L47             QUE  (ALEOCHARA? OR CHRYSOPID# OR CHRYSOPIDAE OR DIABROTICA)
L48             QUE  (PALEXORISTA? OR MAMMAL## OR ANIMAL? OR RABBIT? OR
RODENT#)

BIRD PROFILE   [L94]

L49             QUE  (BLACKBIRD# OR (BLACK(W)BIRD#) OR ((TURDUS OR
T)(W)MERULA))
L50             QUE  (CHAFFINCH? OR ((FRINGILLA OR F)(W)COELEBS) OR
GREENFINCH?)
L51             QUE  (((CARDUELIS OR C)(W)CHLORIS) OR SONGTHRUSH?)
L52             QUE  ((SONG(W)THRUSH?) OR ((TURDUS OR T)(W)PHILOMELOS) OR
WREN#)
L53             QUE  (((TROGLODYTES OR T)(W)TROGLODYTES) OR
(WILLOW(W)WARBLER#))
L54             QUE  (((PHYLLOSCOPUS OR P)(W)TROCHILUS) OR (GREAT(W)TIT#))
L55             QUE  (((PARUS OR P)(W)MAJOR) OR ROBIN# OR GOLDFINCH?)
L56             QUE  (((ERITHACUS OR E)(W)RUBECULA) OR DUNNOCK#)
L57             QUE  (((CARDUELIS OR C)(W)CARDUELIS) OR LINNET#)
L58             QUE  (((PRUNELLA OR P)(W)MODULARIS) OR SKYLARK# OR
(SKY(W)LARK#))
L59             QUE  ((HEDGE(W)(SPARROW# OR ACCENTOR#)))
L60             QUE  (((CARDUELIS OR C)(W)CANNABINA) OR ((ALAUDA OR
A)(W)ARVENSIS))
L61             QUE  ((RED(W)LEGGED(W)PARTRIDGE#) OR ((ALECTORIS OR
A)(W)RUFA))
L62             QUE  ((MEADOW(W)PIPIT#) OR MEADOWPIPIT# OR ((ANTHUS OR
A)(W)PRATENSIS))
L63             QUE  (LAPWING# OR ((VANELLUS OR V)(W)VANELLUS) OR PEEWIT#)
L64             QUE  (STARLING# OR ((STURNUS OR S)(W)VULGARIS))
L65             QUE  ((TURTLE(W)DOVE#) OR ((STREPTOPELIA OR S)(W)TURTUR))
L66             QUE  (YELLOWHAMMER# OR (YELLOW(W)HAMMER#) OR
(YELLOW(W)WAGTAIL#))
L67             QUE  (((EMBERIZA OR E)(W)CITRINELLA) OR
(YELLOW(W)WAG(W)TAIL#))
L68             QUE  (((MOTACILLA OR M)(W)FLAVA) OR
(FAN(W)TAILED(W)WARBLER#))
L69             QUE  ((GREY(W)LAG(W)G!!SE) OR ((ANSER OR A)(W)ANSER))
L70             QUE  (REEDBUNTING# OR (REED(W)BUNTING#) OR ((EMBERIZA OR E)
                    (W)SCHOENICLUS))
L71             QUE  (CHAFFINCH? OR BLUETIT? OR (BLUE(W)TIT?))
L72             QUE  (((PARUS OR P)(W)CAERULEUS) OR (SYLVIA(W)COMMUNIS))
L73             QUE  (((GALERIDA OR G)(W)CRISTATA) OR (TREE(W)SPARROW#))
L74             QUE  (((COTURNIX OR C)(W)COTURNIX) OR (GREY(W)PARTRIDGE#))
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Search Strategy		
L75	QUE	(((PERDIX OR P)(W)PERDIX) OR ((PHASIANUS OR P)(W)COLCHICUS))
L76	QUE	(((MILIARIA OR M)(W)CALANDRA?) OR GREYLAGG!!SE)
L77	QUE	((GREYLAG(W)G!!SE) OR ((COLUMBA OR C)(W)PALUMBUS?))
L78	QUE	(((STREPTOPELIA OR S)(W)(ORIENTALIS? OR RISORIA?)))
L79	QUE	(((MOTACILLA OR M)(W)ALBA?) OR (CRESTED(W)LARK#))
L80	QUE	((WHITE(W)WAGTAIL#) OR (WOOD(W)PIGEON#) OR (BIRD(W)LIFE))
L81	QUE	((SONG(W)BIRD#) OR VANELLUS? OR (PEE(W)WIT#))
L82	QUE	(AVIFAUNA? OR (AVI(W)FAUNA?) OR SONGBIRD?)
L83	QUE	(ORNITHOLOG? OR PASSERINE? OR WOODPIGEON#)
L84	QUE	(((PASSER OR P)(W)MONTANUS) OR QUAIL# OR (CALANDRA(W)LARK#))
L85	QUE	(CISTICOLA? OR (Z(W)CISTICOLA?) OR BIRDLIFE)
L86	QUE	(GEESE OR GOOSE OR SPARROWS OR PIGEONS OR LARK#)
L87	QUE	(WARBLER# OR PARTRIDGE# OR BUNTING# OR WAGTAIL#)
L88	QUE	(WHITETHROAT# OR PIED# OR (WHITE(W)THROAT#))
L89	QUE	((FORAGING OR FARMLAND OR GRASSLAND)(3A)BIRD#)
L90	QUE	(BLUEBIRD# OR (ROCK(W)PTARMIGAN#) OR (BLACK(W)REDSTART#))
L91	QUE	((PREDATOR? OR NONTARGET? OR (NON(W)TARGET))(3A)BIRD#)
L92	QUE	((CORN(W)BUNTING#) OR SERINS OR SERINUS)
L93	QUE	(L49-L92)
L94	QUE	L93 NOT (JAPANESE? OR JAPONICA?)
MAMMALS PROFILE [L105]		
L95	QUE	(((SMALL OR WILD)(3A)MAMMAL#) OR (WILD(3A)ANIMAL?))
L96	QUE	(VOLE# OR GLIS OR DORMOUSE OR DORMICE OR ELIOMY#)
L97	QUE	(LEROT# OR LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS?)
L98	QUE	(HARE# OR SORICIDAE? OR SOREX? OR NEOMY# OR CROCIDURA?)
L99	QUE	(SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS? OR MICROTUS?)
L100	QUE	(CLETHRIONOMYS? OR CRICETIDAE? OR MICROTIN?)
L101	QUE	(RAPTOR# OR MARMOSET# OR GOPHER# OR GRASSCUTTER#)
L102	QUE	((PREDATOR? OR NONTARGET? OR (NON(W)TARGET?))(3A)MAMMAL#)
L103	QUE	((WOOD(W)(MOUSE OR MICE)) OR ARVICOLA?)
L104	QUE	(MEADOW#(W)VOLE#)
L105	QUE	(L95-L104)
EXISTING ECOTOX PROFILE [L171]		
L106	QUE	(ECOTOX? OR LC50 OR ((LC OR EC OR LR)(W)50) OR EC50 OR LR50)
L107	QUE	(ECO OR ECOL OR ECOLOG? OR ENV OR ENVIRONM? OR AQUATIC?)
L108	QUE	(L107(5A)(TOX? OR RISK? OR IMPACT? OR EFFECT?))
L109	QUE	(AQUATIC? OR FRESHWATER? OR (FRESH(W)WATER?))
L110	QUE	(FLORA OR FAUNA OR BIOTA OR ORGANISM? OR INSECT?)
L111	QUE	(ENVIRONM? OR LIFE OR INVERTEB? OR CRUSTACE? OR SPECIES)
L112	QUE	(ENTOMOFAUNA OR (ENTOMO(W)FAUNA))
L113	QUE	(L109(5A)(L110 OR L111 OR L112))
L114	QUE	(MAGNA? OR (D(W)MAGNA?) OR CHIRONOM? OR BRACHIONUS?)
L115	QUE	(LIMNEA? OR CRASSOSTREA? OR ALGA# OR FISH OR FISHES)
L116	QUE	(ONCORHYNCHUS? OR SALMONIDAE? OR CYPRINUS? OR CYPRINID?)
L117	QUE	(PIMEPHALES? OR PISCES OR TROUT OR SUNFISH? OR CARP)

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L118	QUE	(MINNOW? OR (F(W)MINNOW?) OR CATFISH? OR ZEBRAFISH?)
L119	QUE	(GOLDFISH? OR (ZEBRA(W)DANIO#) OR GUPPY OR GUPPIES)
L120	QUE	(KILLFISH? OR FATHEAD? OR BLUEGILL? OR SALMON#)
L121	QUE	(THUNDERFISH? OR (WATER(W)(FLY OR FLEA?)) OR WATERFLEA?)
L122	QUE	(FROG# OR AMPHIBIA? OR SHRIMP# OR PRAWN# OR CRAB# OR TOAD#)
L123	QUE	(TADPOLE# OR CRAYFISH? OR SHELLFISH? OR LOBSTER#)
L124	QUE	(OYSTER# OR SNAIL# OR RANA OR RANIDAE? OR PLANKTON?)
L125	QUE	L106 OR L108
L126	QUE	((NONTARGET? OR (NON(W)TARGET?))(5A)(PLANT? OR FLORA?))
L127	QUE	((AQUATIC(3A)(PLANT? OR (PHYTO(W)TOX?) OR PHYTOTOX?)))
L128	QUE	(SEDIMENT? OR HYDROSOIL? OR DUCKWEED? OR PONDWEED?)
L129	QUE	(((DUCK OR POND)(W)WEED#) OR MACROPHYT? OR PERIPHYTON?)
L130	QUE	(POTAMOGETON? OR CHAROPHYTA? OR ELODEA? OR HYDROCHARITA?)
L131	QUE	(CERATOPHYL? OR CHLAMYDOMON? OR SELENASTRUM? OR CHLORELLA?)
L132	QUE	(SCENEDESMUS? OR SKELETONEMA? OR NAVICULA? OR ANABAENA?)
L133	QUE	(MYRIOPHYLLUM? OR GLYCERIA?)
L134	QUE	(NONTARGET? OR (NON(W)TARGET?) OR BENEFICIAL?)
L135	QUE	(EFFECT? OR INVERTEB? OR ORGANISM? OR ARTHROPOD? OR INSECT?)
L136	QUE	(FAUNA OR SPECIES OR (ENTOMO(W)FAUNA?) OR ENTOMOFAUNA?)
L137	QUE	((L134(5A)(L135 OR L136)))
L138	QUE	(PREDAT? OR (NATURAL(W)ENEM?) OR BEE OR BEES OR HONEYBEE#)
L139	QUE	(BUMBLEBEE# OR ((HONEY OR BUMBLE)(W)BEE#) OR EARTHWORM?)
L140	QUE	((EARTH(W)WORM?) OR LADYBUG# OR LADYBEETLE# OR LADYBIRD#)
L141	QUE	((LADY(W)(BUG# OR BEETLE# OR BIRD#)) OR HOVERFLY)
L142	QUE	(HOOVERFLIES OR SAWFLY OR SAWFLIES OR DRONEFLY)
L143	QUE	(DRONEFLIES OR FLOWERFLY OR FLOWERFLIES OR LACEWING?)
L144	QUE	(((HOVER OR DRONE OR FLOWER OR SAW)(W)(FLY OR FLIES)))
L145	QUE	(SPIDER# OR SPRINGTAIL? OR (ROOT(W)WORM#) OR ROOTWORM#)
L146	QUE	(L137-L145)
L147	QUE	(BIRD? OR AVES OR AVIAN? OR (AVI(W)FAUNA?) OR AVIFAUNA?)
L148	QUE	(SONGBIRD? OR (SONG(W)BIRD?) OR ORNITHOLOG?)
L149	QUE	(L147 OR L148)
L150	QUE	((WILD(3A)(LIFE OR ANIMAL#)) OR WILDLIFE OR SQUIRREL?)
L151	QUE	(VOLE# OR SCIURUS OR GLIRID? OR GLIS OR DORMOUSE)
L152	QUE	(DORMICE OR ELIOMYS OR LEROT# OR MUSTELID? OR MINK#)
L153	QUE	(MUSTELINE# OR WEASEL? OR STOAT? OR MUSTEL? OR BADGER?)
L154	QUE	(MELES OR MELINAE OR OTTER# OR LUTRA OR LUTRINAE)
L155	QUE	(LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS OR HARE#)
L156	QUE	(TALPA OR MOLE OR MOLES OR HEDGEHOG? OR (HEDGE(W)HOG?))
L157	QUE	(CROCIDURA? OR SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS)
L158	QUE	(MICROTUS OR ARVICOLA OR CLETHRIONOMYS? OR CRICETIDAE?)
L159	QUE	(ERINACEUS OR ERINACEIDAE? OR SORICIDAE? OR SOREX)
L160	QUE	(ENDOCRIN? OR HORMON?)
L161	QUE	(DISRUPT? OR MIMIC? OR MODULAT? OR DISORDER? OR DISEASE?)
L162	QUE	(L160(5A)L161)
L163	QUE	(DAPHNI? OR CERIODAPHNI? OR HYALELLA? OR ASSELLUS)
L164	QUE	(L113-L124) OR L163
L165	QUE	(PHYTOPLANKTON? OR AUFWUCH# OR LEMNA? OR ARALES OR

Search Strategy
CHARA)
L166 QUE (L126-L129) OR (L130-L133) OR L165
L167 QUE (NEOMYS OR MICROTINAE?)
L168 QUE (L150-L159) OR L167
L169 QUE (LOACH? OR STICKLEBACK? OR MUMMICHOG# OR TILAPIA? OR ASELLUS)
L170 QUE L164 OR L169
L171 QUE L125 OR L170 OR L166 OR L146 OR L149 OR L168 OR L162
L172 QUE (L1-L48)
L173 QUE (L171 OR L172 OR L94 OR L105) TOTAL PROFILE

Table 2.4-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	138
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		82 (1)
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		0
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		2
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		2

Provider	Database	Justification	Limits applied	Number*
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		45 (2)
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		15
	HCAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		148 (1)
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		0
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		3 (2)

Provider	Database	Justification	Limits applied	Number*
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		1
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (searches 1-5 only).		1
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		6
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		0

* Total number of summary records retrieved after removing duplicates, number in parenthesis is number in Search 4

Table 2.4-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.4-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.5 Environmental Fate

Table 2.5-1: Detailed Search Parameters for Fate and behaviour in the environment (CA 7.1.1 to 7.5)

Search Strategy
Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (FATE# OR DEGRAD? OR PERSIST? OR DECOMP? OR DECAY?) L2 QUE (TRANSFORM? OR DETERIORAT? OR METAB? OR DEGENERAT?) L3 QUE (BIODEGRAD? OR BIOTRANSFORM? OR BIODETERIORAT?) L4 QUE (BIODEGENERAT? OR BREAKDOWN? OR BREAKSDOWN?) L5 QUE (((BROKEN? OR BREAK?)(W)(UP OR DOWN)) OR HALFLIFE#) L6 QUE (HALFLIVES OR HALF(W)(LIFE OR LIVES) OR DEGRDN# OR DECOMPN#) L7 QUE (BIODEGRDN# OR DEGN# OR BIODEGN# OR DISSIP? OR RESIDUE?) L8 QUE (LEACH? OR TRANSPORT? OR MOBIL? OR MOVEMENT? OR HYDROLY?) L9 QUE (ADSORP? OR ADSORB? OR SORP? OR SORB? OR DESORP?) L10 QUE (DESORB? OR RUNOFF OR (RUN#(W)OFF) OR DRAIN? OR PERCOLAT?) L11 QUE (WASHOFF? OR WASHOUT? OR (WASH?(W)(OUT OR OFF))) L12 QUE ((((OFF(W)TARGET) OR LATERAL OR HORIZONTAL)(3W)MOVE?)) L13 QUE (PHOTOLY? OR PHOTODEGRAD? OR PHOTODECOMP?) L14 QUE (PHOTOTRANSFORM? OR PHOTOSTAB? OR PHOTODEGRDN# OR PHOTODEGN#) L15 QUE ((PHOTO(W)(DECOMP? OR DEGRAD? OR TRANSFORM? OR STAB? OR CHEM?))) L16 QUE (PHOTOCHEM? OR VOLATIL? OR VAPOUR? OR VAPOR? OR DT50 OR DT90) L17 QUE ((DT(W)50) OR (DT(W)90) OR KDOC OR (K(W)DOC) OR KD OR KOC) L18 QUE ((K(W)OC) OR (PARTITION?(3W)COEFF?) OR FREUNDLICH)

Search Strategy	
L19	QUE (SEDIMENT? OR SOIL OR SOILS OR PODZOL? OR CLAY? OR SAND?)
L20	QUE (SILT? OR CHERNOZEM? OR PODSOL? OR LOAM? OR PEAT?)
L21	QUE ((ORGANIC(2W)MATTER?) OR MONTMORIL? OR LATOSOL? OR HUMIC?)
L22	QUE (HUMUS? OR SUBSOIL? OR AIR OR WATER? OR ATMOSPHER?)
L23	QUE (RAIN### OR RAINWATER? OR RAINFALL? OR LEACH?)
L24	QUE (GROUNDWATER? OR ENVIRONMENT? OR PRECIPITAT? OR POND#)
L25	QUE (STREAM# OR RIVER# OR DELTA# OR ESTUAR? OR SEDIMENT?)
L26	QUE (AQUATIC? OR MARINE? OR TIDAL? OR BENTHIC? OR LAKE#)
L27	QUE (BENTHOS? OR LIMNO? OR FRESHWATER? OR SEAWATER?)
L28	QUE (SALTWATER? OR ((GROUND? OR FRESH OR SEA OR SALT)(W)WATER?))
L29	QUE (LACUSTRINE? OR MIRE OR MIRES OR RESERVOIR# OR CANAL#)
L30	QUE (LOCH# OR SEA OR OCEAN OR OCEANS OR LAGOON? OR SEAS)
L31	QUE (SEABED OR SEAFLOOR OR INTERTIDAL? OR SHORE? OR COAST?)
L32	QUE (BRACKISH OR LITTORAL? OR SEASHORE? OR MEIOBENTH?)
L33	QUE (MICROBENTH? OR MACROBENTH? OR HARBOUR# OR FLUVIAL?)
L34	QUE (MARSH? OR BOG OR BOGS OR SWAMP? OR FEN OR FENS OR ALLUVI?)
L35	QUE (MUDFLAT? OR (MUD(W)FLAT?) OR BAY OR BAYS OR CREEK#)
L36	QUE (HYDROSOIL# OR (HYDRO(W)SOIL#) OR MESOCOSM? OR MICROCOSM?)
L37	QUE (WETLAND? OR FENLAND? OR ((WET OR FEN)(W)LAND?))
L38	QUE (WATERWAY? OR WATERSHED? OR (WATER(W)(WAY? OR SHED?)))
L39	QUE (CATCHMENT? OR DITCH? OR DRAIN# OR DRAINAG?)
L40	QUE (((FOLIAGE OR FOLIAR OR LEAF OR LEAVES)(5A)EVAPORAT?))
L41	QUE ((SPRAY? OR DUST?)(3A)DRIFT)
L42	QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23 OR L24 OR L25 OR L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR L33 OR L34 OR L35 OR L36 OR L37 OR L38 OR L39 OR L40 OR L41)

Table 2.5-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	186 (1)
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		55 (0)
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		0 (0)
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		0 (0)
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		1 (0)
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		19 (0)
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		16 (3)

Provider	Database	Justification	Limits applied	Number*
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		734 (11)
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0 (0)
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		0 (0)
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0 (0)
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0 (1)
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		2 (2)

Provider	Database	Justification	Limits applied	Number*
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (searches 1-5 only).		9 (0)
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		63 (3)
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		2 (1)

* Total number of summary records retrieved after removing duplicates in Search 1, number in parenthesis is number in Search 4

Table 2.5-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.5-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Document Title

Literature Search
Triazole Derivative Metabolites,
Being Common Metabolites of Triazole-Fungicides

Data requirement

EU Regulation 1107/2009 & EU Regulation 283/2013
Document MCA
Section 9: Literature data

According to the Guidance Document SANCO/10181/2013, for preparing dossiers for the approval of a chemical active substance

Version 7

Date

3rd July 2020

Owner

Triazole Metabolite Derivatives Group (TMDG)

BASF SE, Bayer AG, Dow AgroScience LLC, Isagro S.p.A, Syngenta Crop Protection AG

Author

Helen M Thornton

OWNERSHIP STATEMENT

Version history[1]

Date	Data points containing amendments or additions and brief description	Document identifier and version number

[1] It is suggested that applicants adopt a similar approach to showing revisions and version history as outlined in SANCO/10180/2013 Chapter 4 How to revise an Assessment Report

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CA 9 LITERATURE DATA

A literature search was carried out covering the four common triazole metabolites, 1,2-4-triazole, triazole alanine, triazole acetic acid and triazole lactic acid, as required according to Article 8(5) of Regulation 1107/2009. The literature search was performed in accordance to the provisions of the EFSA Guidance "Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009".

The objective of this literature search document was as a supplement to the previous literature search document, Version 6 of 13th May 2019 which covers the period 9th June 2004 until 10th April 2019. This previous document has been submitted to a number of EU Member States with various parent triazole dossiers from 2014 onwards.

This current literature search covers the period 10th April 2019 – 23rd March 2020 and was the assessment of scientific peer-reviewed open literature dealing with the four common triazole metabolites listed above.

History

This literature search is performed for and owned by the Triazole Derivatives Metabolite Group (TDMG), a task force consisting of five companies, BASF SE, Bayer CropScience AG, Dow AgroScience LLC Isagro S.p.A. and Syngenta Crop Protection AG. These five companies have interests in a number of parent triazole fungicide compounds. The parent triazoles have common metabolites and historically the companies have formed a cooperation to share data and avoid duplicate testing. The TDMG also license data to license holders particularly to avoid duplicate animal testing.

CA 9.1 Summary

This report summarises the search for "scientific peer-reviewed open literature on the four common triazole metabolites, 1,2-4-triazole (124T), triazole alanine (TA), triazole acetic acid (TAA) and triazole lactic acid (TLA), dealing with all sections of the dossier and (together with the previously submitted literature search version 6) published within the last sixteen years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009. This version covers strictly from **10th April 2019 until 23rd March 2020**.

The exact search strategy is detailed in Appendix 1 and 2 but a summary of the methodology employed is given below.

- A very broad search was conducted in a number of scientific source databases (detailed in Appendix 2) for using the search terms listed in Appendix 1.
- Duplicate titles from within each database were automatically removed from the output.
- A rapid relevance assessment of the titles was conducted to remove any additional duplicates between databases and any obviously irrelevant titles (where enough information was available from the title alone).
- Summary abstracts were requested for the remaining titles and a further rapid relevance assessment was conducted where again any clearly irrelevant titles were removed.

- A detailed assessment of the full-text documents for the remaining publications was conducted using the criteria listed in Appendix 1 developed for study relevance

- Any relevant papers were highlighted and assessed for reliability.

An overview of the results is summarised in the table below.

Summary of the review	**Number** **Search: 10th April 2019 until 23rd March 2020**
Total number of summary records retrieved after removing duplicates from all database searches	239
Total number of summary records per dossier section search filter	Physical chemistry 25 Toxicology 60 Metabolism and residues 52 Ecotoxicology 13 Environmental fate 89
Number of summary records excluded after rapid assessment for relevance (by title/abstract)	238
Number of studies excluded from the risk assessment after detailed assessment of full-text documents (i.e. not relevant)	1
Number of studies not excluded for relevance after detailed assessment (i.e. reliable studies and studies of unclear reliability)	0

* aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles, and titles plus abstracts.

CA 9.2 Search strategy

The search strategy is as outlined below with further detail specified, per section, in Appendix 1 and 2.

CA 9.2.1 Date of the search

The table below gives the relevant dates of the searches conducted from Version 6 of this document and this update Version 7:

Previous literature search document	**Version 6**
Date of search 1	10th January 2004 - 10th January 2014
Date of search 2	10th June 2015
Date span of the search 2	10th January 2014 – 9th June 2015
Date of search 3	19th November 2015
Date span of the search 3	10th June 2015 – 18th November 2015
Date of search 4	20th January 2016
Date span of the search 4	19th November 2015 – 20th January 2016
Date of search 5	15th August 2016
Date span of the search 5	20th January 2016 – 15th August 2016
Date of search 6	19th March 2018
Date span of the search 6	15th August 2016 – 19th March 2018
Date of search 7	7th December 2018
Date span of the search 7	20th March – 7th December 2018
Date of search 8	10th April 2019
Date span of the search 8	8th December 2018 – 10th April 2019
Current Literature search document	**Version 7**
Date of search 9	23rd March 2020
Date span of the search 9	10th April 2019 – 23rd March 2020

The previous literature search documents have been submitted to support the review of TDMG parent triazole active substances in various EU Member States as detailed below.

Date	**Parent Triazole Submission**	**RMS**
July 2014	Propiconazole	Finland
Oct 2015	Metconazole	Belgium / UK
Oct 2015	Triticonazole	Austria / UK
Jan 2016	Prothioconazole	UK / France
Mar 2016	Mefentrifluconazole	UK / France
June 2016	Difenconazole	Spain / UK

February 2017	Tebuconazole	UK / Denmark
June 2019	Tetraconazole Penconazole	France /Germany Norway / Germany
August 2020	Paclobutrazol	Austria / Romania

CA 9.2.2 Time window of the literature search

In line with Article 8(5) of Regulation (EC) No 1107/2009 scientific peer-reviewed open literature from 2004 onwards covering more than just the last 10 years prior to the various parent triazole active substance dossier submission dates has been assessed. The initial searches until April 2019 have been summarised in the literature search document Version 6. This document is Version 7 just covering the top up search.

Literature search document	**Version 7**
Date of search 9	23rd March 2020
Date span of the search 9	10th April 2019 – 23rd March 2020

CA 9.2.3 Bibliographic Databases used in the literature review

The bibliographic databases selected cover a wide range of scientific fields and include journals and chapters in books or symposia, conference proceedings, dissertations and reports. All databases were searched using the search strategy given in CA 9.2 combined with the end point specific search terms given in CA 9.2.5 as a single concept approach.

Databases	**Frequency of updates**	**Date of last update**
MEDLINE	1948 to present; 5 times each week with an annual reload	2020-03-22
EMBASE	1974 to present; Updated daily	2020-03-20
ESBIOBASE	1994 to present; Updated weekly	2020-03-19
AGRICOLA	1970 to present; Updated monthly	2020-03-09
BIOSIS	1926 to present; Updated weekly	2020-03-18
CABA	1973 to present; Updated weekly	2020-03-18
HCAPLUS/	1907 to present; Updated daily	2020-03-22
FSTA	1969 to present; Updated weekly	2020-03-19
GEOREF	1669 to present; Updated twice a month	2020-03-13
TOXCENTER	1907 to present; Updated weekly	2020-03-17
PQSCITECH	1962 to present; Updated monthly	2020-02-26
SCISEARCH	1974 to present; Updates weekly	2020-03-16
ANABSTR	1980 to present; Updated weekly	2020-03-19

CA 9.2.4 Input parameters for literature search

Detailed search parameters - Chemical Names and CAS numbers. The following were searched for;

1,2,4-Triazole (CAS: 288-88-0)
Chemical Names:
1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)-
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)-
1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI)
1H-1,2,4-Triazole-1-acetic acid (CA Index Name)
1,2,4-Triazol-1-ylacetic acid
1,2,4-Triazole-1-acetic acid
1H-1,2,4-Triazol-1-ylacetic acid
2-(1,2,4-Triazol-1-yl) acetic acid
2-(1H-1,2,4-Triazol-1-yl) acetic acid
1H-1,2,4-Triazole (CA Index Name)
s-Triazole (8CI)
3,4-Diazapyrrole
4H-1,2,4-Triazole

Using these following parameters dealing with the structure specific search terms;

L1 QUE SPE=ON ABB=ON PLU=ON (288-88-0 OR 1450828-63-3 OR 28711-29-7 OR 333354-47-5 OR 86362-20-1 OR 114419-45-3 OR 4819-36-7 OR 25167-73-1 OR 27236-77-7 OR 116421-29-5 OR 1001118-18-8)

L2 QUE SPE=ON ABB=ON PLU=ON (1,2,4-TRIAZOL-1-YLACETIC ACID OR 1(W)2(W)4(W)TRIAZOLE(W)1(W)ACETIC(W)ACID) OR (1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID) OR (2(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID) OR (2(2W)1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)

L3 QUE SPE=ON ABB=ON PLU=ON ((1H(2W)1(W)2(W)4(W)TRIAZOLE) OR (S(W)TRIAZOLE)) OR ((3(W)4(W)DIAZAPYRROLE) OR (4H(2W)1(W)2(W)4(W)TRIAZOLE)) OR (3(2W)1H(W)1(W)2(W)4(W)TRIAZOL#(W)1(W)YL(W)ALANINE)

L4 QUE E=ON ABB=ON PLU=ON (1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPANOIC(W)ACID) OR (1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPIONIC(W)ACID)

L5 QUE SPE=ON ABB=ON PLU=ON ((2(W)HYDROXY(W)3)(2W)(L4))

L6 QUE SPE=ON ABB=ON PLU=ON ((ALPHA(W)(HYDROXY OR AMINO))(3A)(L4))

L7 QUE SPE=ON ABB=ON PLU=ON (HYDROXY(4W)TRIAZOLE(1W)PROPANOIC ACID OR AMINO(4W)TRIAZOLE(1W)PROPANOIC ACID OR TRIAZOLE(1W)ACETIC ACID OR TRIAZOL(1W)YLACETIC ACID OR TRIAZOL(1W)YL ACETIC ACID OR AMINO(4W)TRIAZOLE(1W)PROPIONIC ACID OR DIAZAPYRROLE OR NSC(W)83128 OR NSC83128)

CA 9.2.5 Endpoint specific search terms

The endpoint specific search terms were specified for each dossier section and are clearly stated in Appendix 2.

CA 9.2.6 Filters

The four common triazole metabolites 124T, TA, TAA and TLA were searched for as described above and in Appendix 1 and 2 across multiple data bases. The results, returned from the "single concept search" for each database, were then checked for duplicates which were removed. The searches were then filtered using the search terms specific to a technical aspect, namely physical chemical properties, toxicology, metabolism and residues, ecotoxicology and environmental fate (refer to Appendix 1 and 2).

CA 9.3 Search results

The results for the top up search of the four triazole metabolites are detailed in Table 9.3-1. The results split across the databases are detailed in Table 9.3-2.

Table 9.3-1.

Data requirement(s) captured in the search	**Physical Chemistry**	**Toxicology**	**Metabolism and Residues**	**Ecotoxicology**	**Environmental Fate**
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	25	60	52	13	89
Number of *summary records* excluded from the search results after rapid assessment for relevance**	25	60	52	13	88
Total number of *full-text* documents assessed in detail*	0	0	0	0	1
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	0	0	0	1
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	0

Table 9.3-2

Dossier Section	Database	Number of unique answers retrieved (after removal of duplicates and manual removal of false positives due to the query being too unspecific*).
Physical Chemistry	CAplus	20
	Medline	1
	SciSearch	1
	Toxcenter	3
Toxicology	CAplus	24
	Medline	10
	SciSearch	2
	Toxcenter	22
	Agricola	1
	CABA	1
Metabolism and Residues	CAplus	28
	Medline	8
	SciSearch	2
	Toxcenter	12
	Agricola	1

	CABA	1
Ecotoxicology	CAplus	4
	Medline	4
	BIOSIS	1
	Toxcenter	3
	CABA	1
Environmental Fate	CAplus	64
	Medline	7
	SciSearch	2
	Toxcenter	14
	CABA	1
	Agricola	1

CA 9.4 Evaluation

The evaluation of the search results is performed according to the EFSA guidance document (EFSA Journal 2011;9(2):2092).

Studies **relevant** to the dossier are those that inform one or more data requirement(s), including hazard identification, hazard characterisation and exposure assessment, for the active substance under assessment, its relevant metabolites, or plant protection products.

This section considers the physical chemical properties, toxicology, metabolism and residue, ecotoxicology and environmental fate data requirements for chemical active substance and plant protection products and other data requirements for which information may have a direct or indirect effect on overall risk assessment (only data requirements under these points having a direct impact on the risk assessment need to be considered).

If a detailed assessment of the study/article was required to determine relevance, the full paper has been provided in KCA Section 9 (and is listed in LCA Section 9).

In case of relevant studies/articles, the full paper is provided and a detailed summary is included in the MCA Section 6.

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CA 9.4.1 Rapid assessment

For the initial rapid assessment, titles were first scanned to identify whether the studies were obviously not relevant. If enough information was available from the title alone to determine that studies were clearly irrelevant, the titles were disregarded. Summary abstracts were then requested for the remaining titles and a further rapid assessment was conducted, where again any irrelevant studies were removed. Any studies clearly not in the remit of this submission or unambiguously belonging to other sections were excluded.

For the rapid assessment of titles and abstracts the criteria listed in Appendix 1 were applied to assess the publication as being clearly irrelevant – if it was not clear from the title or abstract whether the paper was relevant then the full paper was read and detailed in Table 9.4.2-1.

Table 9.4.1-1.

Data requirement(s) captured in the search	**Physical Chemistry**	**Toxicology**	**Metabolism and Residues**	**Ecotoxicology**	**Environmental Fate**
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	25	60	52	13	89
Number of *summary records* excluded from the search results after rapid assessment for relevance**	25	60	52	13	88
Total number of *full-text* documents assessed in detail*	0	0	0	0	1

So from a total of 239 summary records retrieved, all were excluded except just one from the environmental section that was deemed in need of full assessment.

CA 9.4.2 Detailed assessment

With 238 articles in total excluded at the rapid assessment, one article in total from the environmental fate section remained which underwent detailed assessment based on the full-text document. This one article was evaluated for relevance using the relevance criteria mentioned in Table Appendix 1.5: List of Criteria for relevance for Environmental Fate. The evaluation is tabulated below:

Table 9.4.2-1: Publications excluded from the risk assessment after detailed assessment of full-text documents

Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)
Top-up search conducted in 9th June 2019 until 23rd March 2020				
Jungmin, Yi, Seung Wook Baek & Sung June Cho	2019	Experimental Study on Decomposition and Evaporation Characteristics of N,N,N',N'-Tetramethylethylenediamine and 1,2,4-Triazole	Energies 12(17-p-3208)p	Paper discusses the use and behaviour of Tetramethylethylenediamine mixed with 1,2,4-Triazole as a hypergolic biopropellant in liquid rocket engines. It does not consider any environmentally relevant factors related to the fate of triazoles in the environment and is there considered not relevant for inclusion in the dossier.

Table 9.4.2-2: Relevant studies included in the dossier after detailed assessment of full-text documents for relevance: sorted by data requirement(s)

Data requirement (indicated by the corresponding CA and CP data point number)	Author(s)	Year	Title	Source
No Paper was included after detailed assessment				

Table 9.4.2-3: Relevant studies included in the dossier after detailed assessment of full-text documents for relevance: sorted by author(s)

Author(s)	Data requirement (indicated by the corresponding CA and CP data point number)	Year	Title	Source
No Paper was included after detailed assessment				

Overall Conclusion of Results

No relevant studies or papers were found from all the searches performed on the common triazole metabolites to date. The one paper warranting further attention was examined in detail and also assessed to be non-relevant.

Appendix 1 Criteria for relevance

Appendix 1.1: List of Criteria for relevance for Product Chemistry studies

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
Physical and chemical properties (CA 2.1 to 2.15)	1. Well defined test material (including purity/content) 2. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods, and appropriate sampling regime). 3. Study conditions should not differ significantly from recommended protocols* and internationally agreed tests methods (CIPAC MT and OECD methods). 4. Study conditions should not interfere with the interpretation of the study results. 5. End-points or positions stated as a result of the study significantly affect the proposed risk assessment in the dossier.

Table Appendix 1.2: List of Criteria for relevance for toxicological and toxicokinetic studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
*CA 5.1 ADME studies	1. Well identified test material including purity and impurity profile 2. Relevant test species e.g. rodent – rat/mouse – non-rodent – dog 3. Relevant endpoint e.g. ADME measurement or metabolite identification 4. Well described condition of the test and quantitative assessment of results to substantiate and evaluate whether the study conclusions and endpoints are robust
*CA 5.2 Acute toxicity	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rats and mice, rabbit, guinea pig 3. Relevant route of administration for risk assessment 4. Describe observations, examinations, analyses performed or necropsy 5. Different outcome to those studies currently reported
*CA 5.4 Genotoxicity	1. Well identified test material including purity and impurity profile 2. Relevant cell line or species used 3. “validated” or widely used test method 4. In vitro observation not addressed by in vivo data (including tissue specific effects) 5. In vivo effect in somatic or germs cells in relevant species 6. Relevant route of exposure to test substance 7. Contradicts submitted studies, impacts WoE. 8. Recognised methods for scoring studies outcomes used where applicable
*CA 5.3, 5.5, 5.6, 5.7, 5.8.1 Short term, chronic, reproductive and neurotoxicity, studies on metabolites	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rodents rats and mice, non- rodent dog is preferred 3. Sufficient number of animals per group to establish statistical significance 4. Test several dose levels (minimum 3) 5. Relevant route of administration for risk assessment 6. Include negative control (preferable) 7. Establish dose response 8. Describe observations, examinations, analyses performed or necropsy 9. Contradicts submitted studies and/or changes key endpoints

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
CA 5.8.2 Supplementary studies on the active substance	1. Identified test material 2. Unusual routes of exposure acceptable as they may introduce important information on other possible toxicological effects 3. Regulatory use usually limited to addressing species sensitivity /safety factors etc. 4. Examples of studies a. Effects of combined exposures b. Hormonal effects (if not guideline studies or included in 5.8.3) c. Hypersensitivity of specific sub-populations d. Gender and age variation in susceptibility (if not included in 5.6 Reproductive studies) e. Mode of action investigations
CA 5.8.3 Endocrine disrupting properties	1. Identified test material 2. All studies considered relevant at this stage – need to be checked for reliability
CA 5.9 Medical data (including epidemiology) CP 7.2 to 7.4	1. Identified test material 2. All records considered relevant at this stage - need to be checked for reliability

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1.3: List of Criteria for relevance for Metabolism and Residues

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
Metabolism and residues data (CA 6.1 to 6.9)	
Summary	The relevance criteria applied to determine whether a literature reference was relevant for the residues and metabolism sections of the active substance renewal process are given below. 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species. e.g. is the crop a representative use; were relevant animal commodities used? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. did the study meet the relevant guidelines? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. was the compound used previously at the trial site; was the animal feed free from the compound? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 6. Validated Analytical methodology employed. e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given? 7. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.1 Storage Stability of Residues (plant and animal)	Storage Stability Studies 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species.

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	e.g. is the crop a representative use; were relevant animal commodities used? 3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. did the study meet the relevant guidelines and GAP? 4. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 5. Validated analytical methodology employed e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given? 6. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.2 Metabolism, distribution and Expression of Residues (plant and animal) **CA 6.6.2 Metabolism and Distribution in Succeeding Crops**	1. Well defined test material. e.g. if radiolabelled material was used, was an appropriate isotope used? 2. Applicable test species. e.g. ruminant, poultry, etc.? 3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. is the application rate relevant and equivalent to maximum seasonal rate on rotated crops? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. is plot history supplied? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. Were metabolites identified by appropriate techniques? 6. Validated analytical methodology employed. e.g. were representative clear chromatograms provided to support metabolite identification? 7. Study conditions do not interfere with the interpretation of the study results. e.g. if the test item is photolabile was the study conducted outdoors?
CA 6.3 Magnitude of Residues Trials in Plants	Published monitoring reports were not considered relevant due to the fact that it would not be possible to determine whether or not a misuse scenario had resulted in the residue levels reported. <u>Crop Studies</u> 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. 7. Study conditions should not interfere with the interpretation of the study results. <u>Notes for above criteria</u> 1. Well defined test material (including purity/content) e.g. was the formulation comparable to the proposed representative formulation? 2. Applicable test species e.g. is it a representative use crop? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Is the GAP relevant? Correct rate, application method, interval, PHI, spray volume, BBCH (if applicable), region, indoor/outdoor, control samples taken?

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	e.g. were weather details available? e.g. were the control plots well separated from treated plots? e.g. was the field phase conducted according to GLP? e.g. were samples stored deep frozen? Were appropriate numbers of samples taken, e.g. 2kg of apples? e.g. was appropriate sampling methodology employed? Was the sample handling traceable? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. Plot history supplied, e.g. evidence that compound not used that year or previous year, and information on other plant protection products (e.g. to check for common metabolites). 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above and also, have they proposed an endpoint, e.g. MRL, what statistical methods have they used for this? 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Was a validated method used, were acceptable recoveries obtained, were control samples analysed, were control samples 'clean', were representative clear chromatograms provided, Was the analytical phase conducted according to GLP? Were all components of the residue definition analysed for? Were samples analysed within a time period covered by storage stability data?
CA 6.4 Livestock Feeding Studies	Same criteria as for crop studies, examples could be as above with the following additions. <u>Livestock Feeding Studies Notes</u> 1. Well defined test material (including purity/content) 2. Applicable test species e.g. Ruminant, poultry, pig, fish, any edible animal. 3. Study conditions should not differ significantly from recommended protocols. e.g. is the dosing level extreme? e.g. was the application form appropriate, e.g. capsule? e.g. was the number of test species correct, e.g. three cows, nine hens? e.g. was the dosing period appropriate, e.g. minimum 28 days? e.g. were control animals included? e.g. were the animals healthy? e.g. were the animals acclimatized? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. is it clear that additional animal feed did not contain treated substance? 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.
CA 6.5 Effects of Processing	<u>High Temperature Hydrolysis</u> 1. Well defined test material (including purity/content) e.g. if radiolabelled test item was used, was an appropriate isotope used (e.g. ^{14}C and <u>not</u> ^{3}H)? e.g. if radiolabelled test item was used, was the labelling position(s) appropriate to capture potential metabolites? e.g. if radiolabelled test item was used, was the specific activity adequate to meet an LOQ of 0.01 mg/kg?

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	N.B. If water solubility of test item is < 0.01 mg/L then no study is required and can be deemed non-relevant 2. Applicable test system e.g. Was the test undertaken in a sterilised buffer medium? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Were the temperature and pH conditions applied typical of processing operations carried out on commodities relevant to the test item? e.g. were samples stored deep frozen? 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above e.g. Were metabolites identified by appropriate techniques (e.g. co-chromatography with known standards using two dissimilar chromatographic systems or by techniques capable of positive structural identification e.g. MS, NMR)? 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Were relevant control experiments carried out when harsher techniques (e.g. acid/base hydrolysis) were used to identify metabolites (i.e. to ensure metabolites identified are not merely artefacts)? e.g. were representative clear chromatograms provided to support metabolite identification? e.g. where sample analysis exceeded 6 months from sample collection was storage stability of samples demonstrated? 7. Study conditions should not interfere with the interpretation of the study results. Field Studies 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.
CA 6.6 Residues in Rotational crops	Same criteria as for crop residue studies, examples could be subtly different, e.g. acceptable PBIs, crop types, again monitoring information should not be considered relevant.
CA 6.7 Proposed residue definition and MRLs	Residue definition would only be affected if data generated in another section, e.g. metabolism/tox. MRLs would only be affected if residues generated and this is covered under 6.3.
CA 6.8 Proposed Safety Intervals	Not required. Any animal safety reports that might affect withholding periods would be covered in the review of literature in the Toxicology Section.
CA 6.9 Risk Assessment	Not required – any adverse findings for the risk assessment will have to be due to a data point from one of the other sections, and are therefore covered in other sections of this document.
CA 6.10 Other Studies	Not required.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1.4: List of Criteria for relevance for Ecotoxicology studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Ecotoxicological studies (CA 8.1 to 8.9)	Laboratory Studies 6. Well defined test material (including purity/content) 7. Number of organisms per group sufficient to establish a statistical significance 8. Applicable test species 9. Test organisms are not previously exposed to the test material or other contaminants 10. Several dose levels tested, at least 3, including a negative control, to establish a dose-response, unless the study design is specifically a limit test. Control must be run concurrently with treatments and mortality to be within test validity criteria. 11. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 12. If conducted, analytical confirmation of dosing or sufficient information provided to determine concentrations were within acceptable range (e.g. 80-120%) of nominal targets. 13. Effects are related to single test item, and a quantitative relationship exists between the reported endpoint and risk assessment endpoints of growth, mortality, behaviour and/or reproduction. 14. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 15. Study conditions should not differ significantly from recommended protocols. 16. Study conditions should not interfere with the interpretation of the study results. Field Studies 17. Appropriate and relevant geoclimatic conditions (setting), appropriate application method and rates (exposure) and observation data (biological relevance) to derive endpoints. 18. Well defined test material (including purity/content) 19. Applicable test species 20. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 21. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods and appropriate sampling regime). 22. Study conditions should not differ significantly from recommended protocols, if available for field study. Study conditions should not interfere with the interpretation of the study results

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1.5: List of Criteria for relevance for Environmental Fate

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Route and rate of degradation in soil – Laboratory Studies – aerobic and anaerobic, parent and metabolites CA 7.1.1 CA 7.1.1.1 CA 7.1.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 307) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols e.g. temperature and moisture 6. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 7. Sufficient number of samples taken to determine kinetics (minimum 5) 8. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 9. Analytical method well described, LOD/LOQ at appropriate level 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 11. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 12. Identification of 'new' metabolites is robust with appropriate details of method used 13. Anaerobic conditions are verified by measurement
Route and rate of degradation in soil – Field Studies CA 7.1.2.2	1. In addition to criteria under laboratory route and rate: 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate weather data available to verify relevance of study 4. Application technique relevant to proposed use (foliar, ST granule etc) 5. Sufficient sampling detail and description of sample handling prior to analysis 6. Initial and procedural recoveries are adequate to support the conclusions, e.g. 70-120%.
Soil photolysis CA 7.1.1.3	In addition to criteria under laboratory route and rate: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Mobility studies Adsorption, desorption – parent and metabolites CA 7.1.3 Column or TLC leaching CA 7.1.4.1.1, CA 7.1.4.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 106) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols 6. Application rate is appropriate to the proposed use and can be verified from the data 7. Sufficient number of samples taken to determine isotherm (if done) 8. Stability of the test item in the system was demonstrated 9. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Analytical method well described, LOD/LOQ at appropriate level

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	12. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Lysimeter studies CA 7.1.4.2	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data available to verify relevance of study. Combined rainfall/irrigation sufficient to meet guideline requirements 3. Minimum 1 m depth soil monolith 4. Study continued for sufficient years to support the conclusions
Field leaching CA 7.1.4.3.	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data and groundwater data (depth, direction) available to verify the validity of study 3. Installation and operation of lysimeters and/or wells and samplers follows recommended protocols 4. Study continued for sufficient years to support the conclusions
Hydrolysis CA 7.2.1	1. Well defined test material (including purity/content) 2. Experimental conditions should not differ significantly from recommended protocols 3. Application rate is within an acceptable the range (e.g. consider solubility) and can be verified from the data (time zero samples) 4. Sufficient number of samples taken to determine kinetics (minimum 5) 5. Analytical method well described, LOD/LOQ at appropriate level 6. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 7. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 8. Identification of 'new' metabolites is robust with appropriate details of method used
Aqueous photolysis CA 7.2.1.2	In addition to criteria under hydrolysis: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Degradation in aquatic systems CA 7.2.2	1. Well defined test material (including purity/content) 2. Water(s) and sediment(s) must be from an agricultural area and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 308) 3. Water/sediment collection, preparation and storage do not differ significantly from recommended protocols 4. Experimental conditions do not differ significantly from recommended protocols e.g. temperature and aeration 5. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 6. Sufficient number of samples taken to determine kinetics (minimum 5) 7. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 8. Analytical method well described, LOD/LOQ at appropriate level 9. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Identification of 'new' metabolites is robust with appropriate details of method used 12. Anaerobic conditions are verified by measurement
Degradation in the saturated zone CA 7.2.3	1. For laboratory studies refer to criteria under laboratory route and rate 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate site characterisation data available e.g. soils, geology, hydrology 4. Installation of samplers e.g. wells, lysimeters follows recommended protocols 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Route and rate of degradation in air CA 7.3.1	1. Experimental conditions or calculations differ significantly from recommended protocols 2. Analytical method well described, LOD/LOQ at appropriate level 3. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Monitoring CA 7.5	1. Site(s) or areas must be geoclimatically relevant for the EU 2. Adequate site characterisation data available e.g. soils, geology, hydrology 3. Installation of samplers e.g. wells, lysimeters follows recommended protocols OR adequate description of wells is available (depth of well, length of screen, depth of screen opening, depth of groundwater) 4. Appropriate sampling methodology. 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. suitable blank controls included 7. For surface water: description of sampling methodology and handling of detects (peaks, interpolated time-step?), linked to rainfall intensity and volume). Discharge volumes, catchment drained area.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Appendix 2 Detailed Search Parameters for each named Dossier section

Appendix 2.1 Product Chemistry

Table 2.1.1: Detailed Search Parameters for Product Chemistry studies (CA 2.1 to 2.15)

Search Strategy
Chemical Names: 1,2,4-Triazole (CAS: 288-88-0) Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (((VAPOUR OR VAPOR)(3A)PRESSURE?) OR SOLUBILITY?) L2 QUE ((PARTITION(3A)COEFF?) OR EXPLOSIV? OR OXIDI!ING?) L3 QUE (OXIDI!ED? OR FLAMMAB? OR (FLASH(3A)POINT?)) L4 QUE (VOLATIL? OR VISCOS? OR VISCOUS? OR (LOG(W)KOW)) L5 QUE (VAPORI!AT? OR VAPOURI!AT? OR VAPOR!ED? OR VAPOURI!ED?) L6 QUE ((SPECIFIC(3A)GRAVITY?) OR ((MELTING OR BOILING)(2W)POINT)) L7 QUE (EVAPORAT? OR DENSITY OR LOGP OR (LOG(W)P) OR KOC) L8 QUE ((DIFFUSION(3A)COEFF?) OR (DISSOCI?(3A)CONSTANT?)) L9 QUE (ANTIINFLAMM? OR ANTIIGNIT? OR IGNIT? OR COMBUST?) L10 QUE ((L1 OR L2 OR L3) OR (L4 OR L5 OR L6) OR (L7 OR L8 OR L9))

Table 2.1.2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.	
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)	
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.	
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.	
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.	
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.	

Provider	Database	Justification	Limits applied
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily	
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.	
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)	
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.	
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly	
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.	

Provider	Database	Justification	Limits applied
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly. (Searches 1-5 only)	
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.	
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.	

* Total number of summary records retrieved after removing duplicates

Table 2.1.3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.1.4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.1.5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.2 Toxicology

Table 2.2.1: Detailed Search Parameters for Toxicological and Toxicokinetic studies (CA 5.1 to 5.9)

Search Strategy
Chemical Names: 1,2,4-Triazole (CAS: 288-88-0) Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (MUTAG? OR CANCER? OR TERATO? OR GENETOX? OR CARCIN?) L2 QUE (TUMOUR? OR TUMOR? OR CYTOTOX? OR GENOTOX? OR MELANOM?) L3 QUE (NEUROTOXI? OR LD50 OR IC50 OR ((LD OR IC)(W)50)) L4 QUE (((LONG OR SHORT)(W)TERM?)(L)(EFFECT? OR STUD? OR TOXIC?)) L5 QUE (ENDOCRIN? OR INHALAT? OR IRRITAT? OR REPROTOX?) L6 QUE (PERCUTANEOU? OR DERMAL? OR ORAL? OR INTOXICAT? OR INGEST?) L7 QUE (((REPRODUCT? OR EMBRYO? OR FOET? OR DEVELOP?)(5A)TOXI?)) L8 QUE ((ACUTE? OR CHRONIC?)(5A)(EFFECT? OR TOXIC? OR TOXIN#)) L9 QUE (GIRL# OR CHILD OR CHILDREN OR PATIENT# OR HUMAN# OR MAN) L10 QUE (MEN OR WOM!N OR BOY# OR WORKER# OR OPERATOR# OR FARMER#) L11 QUE (APPLICATOR# OR PERSONNEL? OR WORKFORCE OR EMPLOYEE#) L12 QUE (MAMMAL? OR RODENT# OR RAT OR RATS OR MOUSE OR MICE) L13 QUE (ACCIDENT? OR POISON? OR ALLERG? OR EXPOSURE? OR EXPOSE#) L14 QUE (OCCUPAT? OR EPIDEMIOL? OR SENSITIZ? OR SENSITIS?) L15 QUE ((HEALTH OR ADVERSE)(5A)(EFFECT# OR RISK#)) L16 QUE (MEDICAL OR (FIRST(W)AID) OR (TOXIC?(3A)STUD?) OR THERAPE?) L17 QUE (TOXICOKINETIC# OR EXTRACTAB? OR (RADIO(W)LABEL?)) L18 QUE (DOG# OR (GUINEA(W)PIG#) OR RABBIT# OR SKIN? OR EYE#) L19 QUE (HAND# OR DERMAL? OR BYSTANDER# OR RESIDENT#) L20 QUE ((ROTAT? OR SUCCEDING OR FOLLOWING)(3A)CROP#) L21 QUE ((DIETARY OR CONSUM? OR CUMULAT? OR AGGREGAT?)(5A)RISK?) L22 QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21)

Search Strategy
L2 QUE SPE=ON ABB=ON PLU=ON ABNORMAL BEHAVIOUR OR ABORTION OR ACCEPTABLE DIETARY INTAKE OR ACCEPTABLE OPERATOR EXPOSURE LEVEL OR ACUTE DERMAL APPLICATION OR ACUTE DERMAL TOXICITY OR ACUTE EFFECT OR ACUTE EXPOSURE OR ACUTE ORAL TOXICITY OR ACUTE REFERENCE DOSE
L3 QUE SPE=ON ABB=ON PLU=ON ACUTE TOXICITY OR ADDITIVE TOXICITY OR ADULT MORTALITY OR ADVERSE EFFECT OR ADVERSE EVENT OR AERIAL EXPOSURE OR AIR BLAST OR AIRBLAST OR ANORMAL BEHAVIOUR OR ASSESSMENT(1W)RISK OR AVERSIVE RESPONSE OR BBA MODEL OR BEHAVIOUR
L4 QUE SPE=ON ABB=ON PLU=ON BEHAVIOURAL ANOMALIES OR BIO MONITORING OR BIOMONITORING OR BIRTH RATE OR BODY ORGANS OR BODY WEIGHT OR BREEDING LOSS OR BYSTANDER OR CARCINOGEN OR CARCINOGENIC OR CARCINOGENICITY OR CHANGE (1W) BODY WEIGHT OR CHEMOSIS OR CHRONIC CONCERN
L5 QUE SPE=ON ABB=ON PLU=ON CHRONIC EFFECT OR CHRONIC STUDY OR CHRONIC TEST OR CHRONIC TOX OR CHRONIC TOXICITY OR CHRONIC TOXICOLOGICAL STUDY OR CLASTOGENICITY OR CLINICAL SIGN OR CLINICAL SYMPTOM OR CONJUNCTIVAE OR CONJUNCTIVAL CHEMOSIS OR CONJUNCTIVAL SAC
L6 QUE SPE=ON ABB=ON PLU=ON CONSTIPATIO OR CONSUMER OR CONTACT TOXICITY OR CORNEA OR CORNEAL OPACITY OR CREATININE OR CROP INSPECTION OR CYTOPLASMIC CHANGES(1W)HEPATOCYTES OR DAMAGE TO EYES OR DEAD EMBRYO OR DEAD FETUS OR DEAD PUP OR DEATH OR DECREASE(1W)BODY LENGTH
L7 QUE SPE=ON ABB=ON PLU=ON DERMAL OR DEVELOPMENTAL TOXICITY OR DIARRHEA OR DIE OR DIED OR DIETARY EXPOSURE OR DIETARY INTAKE OR DIETARY TOXICITY OR DIPPING OR DISLODGEABLE FOLIAR RESIDUE OR DISORIENTING OR DISTURBANCE(1W)VIABILITY OR DOG OR DUST DRIFT
L8 QUE SPE=ON ABB=ON PLU=ON EFFECT(1W)(BODY WEIGHT OR FOOD CONSUMPTION OR BODY ORGAN) OR EMBRYO OR EMBRYOPATHY OR EMBRYOTOX OR ENDOCRINE(W)DISRUPT? OR ENDOCRINE MODULATION OR ENGINEERING CONTROL OR EPIDEMIOLOGICAL OR EPIDEMIOLOGY OR ERYTHEMA
L9 QUE SPE=ON ABB=ON PLU=ON ESCHAR OR EUROPOEM OR EXPOSE OR EXPOSURE OR EYE IRRITATION OR FECUNDITY OR FEEDING STUDY OR FERTILITY RATE OR FETOTOX OR FETOTOXICOLOGICAL OR FETOTOXICOLOGY OR FOETAL CROWN-RUMP LENGTH OR FOETAL DEVELOPMENT OR FOGGING OR FOLIAR DEPOSITION
L10 QUE SPE=ON ABB=ON PLU=ON FOLIAR DISLODGEABLE RESIDUE OR GAIN(1W)BODY WEIGHT OR GASTROINTESTINAL OR GENOTOX OR GENOTOXIC OR GENOTOXICITY OR GENOTOXICOLOGICAL OR GESTATION OR GROUND BOOM OR GROUNDBOOM OR GUINEA PIG OR HAIR LOSS OR HAND TO MOUTH OR HANDHELD OR HAND-HELD
L11 QUE SPE=ON ABB=ON PLU=ON HAZARD OR HEALTH RISK OR HEPATOTOXIN OR HERSHBERGER ASSAY OR HUMAN EXPOSURE OR HUMAN HEALTH OR HUMAN MONITORING OR IMMUNOTOXICITY OR IMPLANTATION LOSS OR INCREASE (1W) LIVER WEIGHT OR INDURATION (2W) SKIN OR INFERTILITY
L12 QUE SPE=ON ABB=ON PLU=ON INHALATION OR INHALATORY ABSORPTION OR INHALATORY EXPOSURE OR INHALATORY RISK OR INTOXICATION OR INTRAPERITONEAL OR INTRAVENOUS OR INTRAVENOUSLY OR IRRITANT OR IRRITATING (1W)SKIN OR IRRITATION OR IRRITATION (2W)(IRIS OR SKIN)
L13 QUE SPE=ON ABB=ON PLU=ON KNAPSACK OR LABORED BREATHING OR LACERATION (2W) SKIN OR LACTATION OR LC50 OR LD50 OR LIGHT-COLORED FECES OR LITTER SIZE OR LITTER WEIGHT OR LIVER OR LIVING PUPS OR LOCAL LYMPH NODE OR LONG-TERM EXPOSURE OR LONGTERM STUDY OR LONG-TERM STUDY
L14 QUE SPE=ON ABB=ON PLU=ON LONGTERM TOXICOLOGICAL OR LONG-TERM TOXICOLOGICAL OR LOSS (1W)(BODY WEIGHT OR HAIR) OR MALFORMATION OR MAMMAL OR MAMMALIAN OR MARGIN (1W) SAFETY OR MATERNAL TOXICITY OR MATING BEHAVIOUR OR MEDICAL DATA OR METABOLIC PATH

Search Strategy	
	OR METABOLIC PATHWAY
L15	QUE SPE=ON ABB=ON PLU=ON MONKEY OR MORTALITY OR MOUSE OR MRL EXCEEDANCE OR MRL VIOLATION OR MULTIGENERATION OR MUTAGEN OR MUTAGENIC OR MUTAGENICITY OR NECROPSY OR NEUROTOXIC OR NEUROTOXICITY OR NO OBSERVED ADVERSE EFFECT LEVEL OR NO OBSERVED EFFECT LEVEL
L16	QUE SPE=ON ABB=ON PLU=ON NOAEL SUBCHRONIC DOG OR NON DIETARY EXPOSURE OR NON-DIETARY EXPOSURE OR NO-OBSERVED ADVERSE EFFECT LEVEL OR NURSING OR OBJECT TO MOUTH OR OCCUPATIO NAL EXPOSURE OR OEDEMA OR OFFSPRING OR OPACITY OR OPERATOR OR ORAL ABSORPTION OR ORAL TOXICITY
L17	QUE SPE=ON ABB=ON PLU=ON ORALLY OR OVULATION OR PARENTERAL OR PARTURITION OR PASSIVE DOSIMETRY OR PATHOLOGICAL OR PATHOLOGY OR PATIENT OR PEELING (1W) SKIN OR PENETRATION FACTOR OR PERCUTANEOUS OR PERSONAL PROTECTIVE EQUIPMENT OR PHOTOTOXICITY OR PILOERECTION
L18	QUE SPE=ON ABB=ON PLU=ON PLACENTAL WEIGHT OR POISON OR POISONING OR POST-MORTEM EXAMINATIONS OR POSTNATAL OR POST-NATA L OR PREGNANCY OR PREGNANT OR PREMATURE BIRTH OR PRENATAL TOX OR PRENATAL TOXICOLOGY OR PRIMATE OR PROTECTIVE CLOTHING OR PROTECTIVE GARMENT
L19	QUE SPE=ON ABB=ON PLU=ON PROTECTIVE GLOVE OR PUBLIC HEALTH OR RABBIT OR RAT OR RE ENTRY OR REDDENING (1W) TREATMENT AREA OR REDNESS OR REDUCED BODY WEIGHT OR REDUCED BODY WEIGHT GAIN OR REENTRY OR RE-ENTRY OR REFERENCE DOSE OR RELEVANT (2W) REPRODUCTIVE SUCCESS
L20	QUE SPE=ON ABB=ON PLU=ON REPRODUCTION OR REPRODUCTIVE OR REPROTOX OR RESIDENT OR RESIDENTIAL EXPOSURE OR RESIDUE IN OR RESPIRATORY EXPOSURE OR RESPIRATORY PROTECTIVE EQUIPMENT OR RISK ASSESSMENT OR RISK (2W) (CONSUMER OR OPERATOR) OR SEXUAL
L21	QUE SPE=ON ABB=ON PLU=ON RISK (1W) SERIOUS DAMAGE (1W) EYES OR SAFE OR SAFETY OR SAFETY ASSESSMENT OR SAFETY PRECAUTION OR SECONDARY EFFECT OR SECONDARY POISONING OR SEEDTROPEX OR SENSITISATION BY SKIN CONTACT OR SENSITISER OR SENSITISING TESTS OR SENSITIZER
L22	QUE SPE=ON ABB=ON PLU=ON SHORT LONG TERM EXPOSURE OR SHORT-TERM EXPOSURE OR SHORT-TERM TOXICITY OR SHORT-TERM TOXICOLOGICAL OR SIDE EFFECT OR SIGNS (1W)(AGGRESSION OR TOXICITY) OR SKIN IRRITANT OR SKIN IRRITATION OR SKIN SENSITISA TION OR SKIN SENSITISING
L23	QUE SPE=ON ABB=ON PLU=ON SKIN SENSITIZATION OR SKIN SENSITIZING OR SLIGHTLY HARMFUL OR SPASTIC GAIT OR SPERMATOGENE SIS OR SPLEEN OR SPRAY DRIFT OR STOMACH LESIONS OR STUNTED FETUS OR SUBACUTE OR SUB-ACUTE OR SUBCHRONIC OR SUB-CHRONIC OR SUBLETHAL OR SUB-LETHAL
L24	QUE SPE=ON ABB=ON PLU=ON SUBSTANCE-RELATED EFFECT OR SURVIVAL OR SYMPTOMS (1W) TOXICITY OR SYSTEMIC EXPOSURE OR SYSTEMIC INTOLERANCE REACTIONS OR TERATOGEN OR TERATOGENIC OR TERATOGENICITY OR TERATOLOGY OR TESTICULAR DEVELOPMENT
L25	QUE SPE=ON ABB=ON PLU=ON ACTIVE INGREDIENTS (1W) SAFE OR (COMPOUND OR COMPOSITION OR FUNGICIDE OR INSECTICIDE OR PESTICIDE) (1W)SAFE OR THEORETICAL TOXICITY OR TOPICAL OR TOTAL DIET STUDY OR TOX OR TOXIC OR TOXICITY OR TOXICOGENOMIC OR TOXICOKINETICS OR TOXICOL
L26	QUE SPE=ON ABB=ON PLU=ON TOXICOLOGICAL OR TOXICOLOGY OR TRACTOR MOUNTED OR TRANSDERMAL OR TRANSFER COEFFICIENT OR TRANSFERABLE RESIDUES OR TREATMENT RELATED EFFECTS OR TUMORIGEN OR TUNNEL TEST OR TWO-GENERATION OR UNACCEPTABLE EFFECTS OR UTEROTROPHIC ASSAY
L27	QUE SPE=ON ABB=ON PLU=ON VERTEBRATE OR VIABILITY (1W) EMBRYO OR WEANING OR WEIGHT ALTERATION OR WEIGHTS OR WHOLE BODY DOSIMETER OR WHOLE BODY DOSIMETRY OR WORKER

Table 2.2.2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.	
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)	
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.	
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.	
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.	
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.	

Provider	Database	Justification	Limits applied
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily	
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.	
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)	
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.	
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly	
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.	

Provider	Database	Justification	Limits applied
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (Searches 1-5 only).	
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.	
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.	

* Total number of summary records retrieved after removing duplicates

Table 2.2.3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.2.4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.2.5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.3 Metabolism and Residues

Table 2.3.1: Detailed Search Parameters for Metabolism and Residues data – Search Terms

Search Strategy
Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole PLUS L1 QUE (METABOL? OR RESIDUE# OR TRANSFORM? OR BIOTRANSFORM?) L2 QUE (DEGRAD? OR BIODEGRAD? OR FATE# OR MRL OR MRLS) L3 QUE (CONJUGAT? OR EXCRET? OR ELIMINAT?) L4 QUE (FOOD# OR FEED# OR DIET# OR DIETARY OR CONSUMER? OR HUMAN#) L5 QUE (CONTAMINAT? OR SAFE? OR EXPOS? OR ANALY? OR ASSES?) L6 QUE (INTAKE? OR (IN(W)TAKE?) OR SURVEY? OR RISK?) L7 QUE (TOXIC? OR STUDY? OR STUDIES?) L8 QUE (L4(10A)(L5 OR L6 OR L7)) L9 QUE (LIVESTOCK# OR COW# OR GOAT# OR CATTLE# OR BULLOCK#) L10 QUE (BOVINE? OR BOVIDAE? OR BOS OR BULL# OR HEIFER? OR CAPRA#) L11 QUE (SHEEP# OR EWE OR EWES OR RAM# OR SWINE# OR PIGLET#) L12 QUE (PIG# OR SUIDAE? OR SUS OR OVIS OR OX OR OXEN) L13 QUE (RUMINANT? OR HEN# OR CHICKEN# OR FOWL# OR TURKEY?) L14 QUE (DUCK# OR GOOSE OR GEESE OR CAPON# OR POULTRY?) L15 QUE (MEAT OR MILK OR EGG# OR TISSUE#) L16 QUE (((BROKEN? OR BREAK?)(W)(DOWN OR UP)) OR BREAKDOWN?) L17 QUE (BREAKSDOWN? OR UPTAKE? OR PROCESSING? OR BOUND?) L18 QUE ((NON(W)EXTRACTAB?) OR (ROTATIONAL(3A)CROP#)) L19 QUE ((L1 OR L2 OR L3) OR L8 OR (L9 OR L10 OR L11 OR L12 OR L13 OR L14) OR (L15 OR L16 OR L17 OR L18))

Table 2.3-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number *
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	10 years	856 (600, 172, 84)
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		

Provider	Database	Justification	Limits applied	Number *
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly. (Searches 1-5 only)		
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		

* Total number of summary records retrieved after removing duplicates – numbers in parentheses are the summary records retrieved in the initial search and then
the 1st and 2nd top-up respectively)

Table 2.3-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.3-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.3-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.4 Ecotoxicology

Table 2.4.1: Detailed Search Parameters for Ecotoxicological studies (CA 8.1 to 8.9)

Search Strategy		
L1	**QUE**	**(288-88-0 OR 1450828-63-3 OR 28711-29-7 OR 333354-47-5)**
L2	**QUE**	**(86362-20-1 OR 114419-45-3 OR 4819-36-7)**
L3	**QUE**	**(1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID)**
L4	**QUE**	**(1(W)2(W)4(W)TRIAZOLE(W)1(W)ACETIC(W)ACID)**
L5	**QUE**	**(1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID)**
L6	**QUE**	**(2(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)**
L7	**QUE**	**(2(2W)1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)**
L8	**QUE**	**((1H(2W)1(W)2(W)4(W)TRIAZOLE) OR (S(W)TRIAZOLE))**
L9	**QUE**	**((3(W)4(W)DIAZAPYRROLE) OR (4H(2W)1(W)2(W)4(W)TRIAZOLE))**
L10	**QUE**	**(25167-73-1 OR 27236-77-7 OR 116421-29-5 OR 1001118-18-8)**
L11	**QUE**	**(3(2W)1H(W)1(W)2(W)4(W)TRIAZOL#(W)1(W)YL(W)ALANINE)**
L12	**QUE**	**(1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPANOIC(W)ACID)**
L13	**QUE**	**(1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPIONIC(W)ACID)**
L14	**QUE**	**((2(W)HYDROXY(W)3)(2W)(L12 OR L13))**
L15	**QUE**	**((ALPHA(W)(HYDROXY OR AMINO))(3A)(L12 OR L13))**
L16	**QUE**	**(L1-11 OR L14-15)**
		PLUS
L1	QUE	(RIPARIAN? OR REPTILE? OR SNAKE? OR LIZARD?)
L2	QUE	(TORTOISE? OR TURTLE? OR TERRAPIN? OR CROCODIL?)
L3	QUE	(ALLIGATOR? OR CAIMAN? OR GHARIAL? OR HOVERFLIES)
L4	QUE	((MEADOW#(W)VOLE#) OR PSEUDOKIRSCHNERIELLA)
L5	QUE	(RHAPHIDOCELIS OR NITZSCHIA OR CYCLOTELLA OR MICROCYSTIS)
L6	QUE	(OSCILLATORIA OR APHANIZOMENON OR ANKISTRODESMUS)
L7	QUE	(TEILINGRIA OR MONORAPHIDIUM OR RADIOCOCCACAE OR

Search Strategy
TETRASPORALES)
L8 QUE (TETRAEDRON OR TREUBARIA OR WILLEA OR COSMOCLADIUM)
L9 QUE (HYPOASPIS OR (SOIL(3A)MICROORGAN?) OR ECHINOCHLOA OR SPARTINA)
L10 QUE (SALVINIA OR NAJAS OR CALLITRICHE OR MYOSOTIS OR STRATIOTES)
L11 QUE (HIPPURUS OR PERSICARIA OR CLOEON? OR CORBICULA?)
L12 QUE (NEOCARIDINIA? OR NEOCARIDINA? OR MYSID? OR CICHLIDAE)
L13 QUE (CICHLID# OR LEPOMIS? OR SERRANIDAE OR PERCIFORMES)
L14 QUE (ICTALURUS? OR POECILIA? OR ORYZIAS? OR GASTEROSTEUS?)
L15 QUE (GASTEROSTEIDAE OR SALVELINUS OR BRACHYDANIO? OR CARASSIUS?)
L16 QUE (MISGUMUS? OR CYPRINODON? OR FUNDULUS? OR MISGURNUS?)
L17 QUE (BREAM OR ROTIFER# OR GAMMARUS OR GAMMARID? OR MAYFLY?)
L18 QUE (BIVALVE# OR MUSSEL# OR MOLLUSK# OR MOLLUSC# OR BUFO)
L19 QUE (NEWT# OR SCALLOP# OR CLAM# OR GAMBUSIA OR OREOCHROMIS)
L20 QUE (OSTRAC? OR TUBIFEX? OR TURBELLARIA OR COPEPODA)
L21 QUE (PREDACE? OR PREDACI? OR PARASITOID? OR APIS OR APIDAE)
L22 QUE (BOMBUS OR BOMBINAE OR WORM# OR LUMBRICIDAE OR LUMBRICUS)
L23 QUE (ALLOBOPHORA? OR DENDROBAENA? OR APORRECTODEA? OR DENDRODRILUS?)
L24 QUE (EISENIA? OR OCTOLASION? OR (LACE(W)WING#) OR NEUROPTER?)
L25 QUE (CARABID? OR CARBUS OR STAPHYLINID? OR COCCINEL? OR ADALIA?)
L26 QUE (STETHORUS? OR SCYMNUS? OR WASP# OR VESPIDAE OR SPHECOIDEA)
L27 QUE (SPHECIDAE OR STIZIDAE OR OPIUS OR (ICHNEUMON(W)FL?))
L28 QUE (ICHNEUMONID? OR BRACONID? OR CHALCID? OR CYNIP? OR APHIDI?)
L29 QUE (EUCOILID? OR IBALIID? OR FIGITID? OR EURYTOM? OR TORYM?)
L30 QUE (ORYM? OR EUCHARIT? OR PERILAMP? OR PTEROMAL? OR CHRYSOLAMP?)
L31 QUE (EUPELM? OR ENCYRT? OR SIGNIPHOR? OR APHELIN? OR ELASMID?)
L32 QUE (ELASMUS OR TETRACAMP? OR MYMAR? OR HELOR? OR PROCTOTRUP?)
L33 QUE (DIAPRI? OR SCELION? OR PLATYGASTR? OR PLATYGASTER?)
L34 QUE (CERAPHRON? OR MEGASPIL? OR ARANE? OR OPILION? OR PHALANG?)
L35 QUE (ARACHNID? OR HARVESTM? OR DADDYLONGLEG? OR (DADDY(W)LONG(W)LEG?))
L36 QUE ((DADDY(W)LONGLEG?) OR COLLEMB? OR (SPRING(W)TAIL?) OR CYDNODROMUS?)
L37 QUE (PARDOSA? OR ORIUS? OR TYPHLODROM? OR PHYTOSEIULUS? OR SYRPHID?)
L38 QUE (METASYRPHUS? OR SYRPHUS? OR EUPEODES? OR EPISYRPHUS? OR SYRPHIAN?)
L39 QUE (EPISTROPHE? OR AMBLYSEIUS? OR POECILUS? OR TRECHUS? OR BEMBIDION?)
L40 QUE (NEBRIA? OR PTEROSTICHUS? OR CALOSOMA? OR TACHYPORUS? OR NABIDAE?)
L41 QUE (GEOCORIS? OR HYMENOPT? OR HAEMATOLOECHA? OR CHRYSOPID? OR SYMPHYTA?)
L42 QUE (OULEMA? OR APHYTIS? OR BATHYPLECTES? OR LINPHIIDAE? OR LYNPHIIDAE?)

Search Strategy

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L43             QUE  (LINYPHIIDAE? OR ERIGONE? OR BATHYPHANTES? OR MEIONETA?
OR
                     OEDOTHORAX?)
L44             QUE  (LEPTHYPHANTES? OR LYCOSID? OR LYCOSA? OR CHRYSOPA? OR
DACNUSA?)
L45             QUE  (CYRTORHINUS? OR CRYPTOLAEMUS? OR ZETZELLIA? OR
LEPTOMASTIX?)
L46             QUE  (TRICHOGRAMMA? OR ENCARSIA? OR MACROLOPHUS? OR
CHRYSOPERLA?)
L47             QUE  (ALEOCHARA? OR CHRYSOPID# OR CHRYSOPIDAE OR DIABROTICA)
L48             QUE  (PALEXORISTA? OR MAMMAL## OR ANIMAL? OR RABBIT? OR
RODENT#)

BIRD PROFILE    [L94]

L49             QUE  (BLACKBIRD# OR (BLACK(W)BIRD#) OR ((TURDUS OR
T)(W)MERULA))
L50             QUE  (CHAFFINCH? OR ((FRINGILLA OR F)(W)COELEBS) OR
GREENFINCH?)
L51             QUE  (((CARDUELIS OR C)(W)CHLORIS) OR SONGTHRUSH?)
L52             QUE  ((SONG(W)THRUSH?) OR ((TURDUS OR T)(W)PHILOMELOS) OR
WREN#)
L53             QUE  (((TROGLODYTES OR T)(W)TROGLODYTES) OR
(WILLOW(W)WARBLER#))
L54             QUE  (((PHYLLOSCOPUS OR P)(W)TROCHILUS) OR (GREAT(W)TIT#))
L55             QUE  (((PARUS OR P)(W)MAJOR) OR ROBIN# OR GOLDFINCH?)
L56             QUE  (((ERITHACUS OR E)(W)RUBECULA) OR DUNNOCK#)
L57             QUE  (((CARDUELIS OR C)(W)CARDUELIS) OR LINNET#)
L58             QUE  (((PRUNELLA OR P)(W)MODULARIS) OR SKYLARK# OR
(SKY(W)LARK#))
L59             QUE  ((HEDGE(W)(SPARROW# OR ACCENTOR#)))
L60             QUE  (((CARDUELIS OR C)(W)CANNABINA) OR ((ALAUDA OR
A)(W)ARVENSIS))
L61             QUE  ((RED(W)LEGGED(W)PARTRIDGE#) OR ((ALECTORIS OR
A)(W)RUFA))
L62             QUE  ((MEADOW(W)PIPIT#) OR MEADOWPIPIT# OR ((ANTHUS OR
A)(W)PRATENSIS))
L63             QUE  (LAPWING# OR ((VANELLUS OR V)(W)VANELLUS) OR PEEWIT#)
L64             QUE  (STARLING# OR ((STURNUS OR S)(W)VULGARIS))
L65             QUE  ((TURTLE(W)DOVE#) OR ((STREPTOPELIA OR S)(W)TURTUR))
L66             QUE  (YELLOWHAMMER# OR (YELLOW(W)HAMMER#) OR
(YELLOW(W)WAGTAIL#))
L67             QUE  (((EMBERIZA OR E)(W)CITRINELLA) OR
(YELLOW(W)WAG(W)TAIL#))
L68             QUE  (((MOTACILLA OR M)(W)FLAVA) OR
(FAN(W)TAILED(W)WARBLER#))
L69             QUE  ((GREY(W)LAG(W)G!!SE) OR ((ANSER OR A)(W)ANSER))
L70             QUE  (REEDBUNTING# OR (REED(W)BUNTING#) OR ((EMBERIZA OR E)
                     (W)SCHOENICLUS))
L71             QUE  (CHAFFINCH? OR BLUETIT? OR (BLUE(W)TIT?))
L72             QUE  (((PARUS OR P)(W)CAERULEUS) OR (SYLVIA(W)COMMUNIS))
L73             QUE  (((GALERIDA OR G)(W)CRISTATA) OR (TREE(W)SPARROW#))
L74             QUE  (((COTURNIX OR C)(W)COTURNIX) OR (GREY(W)PARTRIDGE#))
L75             QUE  (((PERDIX OR P)(W)PERDIX) OR ((PHASIANUS OR
P)(W)COLCHICUS))
L76             QUE  (((MILIARIA OR M)(W)CALANDRA?) OR GREYLAGG!!SE)
L77             QUE  ((GREYLAG(W)G!!SE) OR ((COLUMBA OR C)(W)PALUMBUS?))
L78             QUE  (((STREPTOPELIA OR S)(W)(ORIENTALIS? OR RISORIA?)))
L79             QUE  (((MOTACILLA OR M)(W)ALBA?) OR (CRESTED(W)LARK#))
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Search Strategy

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L80             QUE  ((WHITE(W)WAGTAIL#) OR (WOOD(W)PIGEON#) OR
(BIRD(W)LIFE))
L81             QUE  ((SONG(W)BIRD#) OR VANELLUS? OR (PEE(W)WIT#))
L82             QUE  (AVIFAUNA? OR (AVI(W)FAUNA?) OR SONGBIRD?)
L83             QUE  (ORNITHOLOG? OR PASSERINE? OR WOODPIGEON#)
L84             QUE  (((PASSER OR P)(W)MONTANUS) OR QUAIL# OR
(CALANDRA(W)LARK#))
L85             QUE  (CISTICOLA? OR (Z(W)CISTICOLA?) OR BIRDLIFE)
L86             QUE  (GEESE OR GOOSE OR SPARROWS OR PIGEONS OR LARK#)
L87             QUE  (WARBLER# OR PARTRIDGE# OR BUNTING# OR WAGTAIL#)
L88             QUE  (WHITETHROAT# OR PIED# OR (WHITE(W)THROAT#))
L89             QUE  ((FORAGING OR FARMLAND OR GRASSLAND)(3A)BIRD#)
L90             QUE  (BLUEBIRD# OR (ROCK(W)PTARMIGAN#) OR
(BLACK(W)REDSTART#))
L91             QUE  ((PREDATOR? OR NONTARGET? OR (NON(W)TARGET))(3A)BIRD#)
L92             QUE  ((CORN(W)BUNTING#) OR SERINS OR SERINUS)
L93             QUE  (L49-L92)
L94             QUE  L93 NOT (JAPANESE? OR JAPONICA?)

MAMMALS PROFILE  [L105]

L95             QUE  (((SMALL OR WILD)(3A)MAMMAL#) OR (WILD(3A)ANIMAL?))
L96             QUE  (VOLE# OR GLIS OR DORMOUSE OR DORMICE OR ELIOMY#)
L97             QUE  (LEROT# OR LAGOMORPH# OR LEPORID? OR LEPUS OR
ORYCTOLAGUS?)
L98             QUE  (HARE# OR SORICIDAE? OR SOREX? OR NEOMY# OR CROCIDURA?)
L99             QUE  (SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS? OR
MICROTUS?)
L100            QUE  (CLETHRIONOMYS? OR CRICETIDAE? OR MICROTIN?)
L101            QUE  (RAPTOR# OR MARMOSET# OR GOPHER# OR GRASSCUTTER#)
L102            QUE  ((PREDATOR? OR NONTARGET? OR
(NON(W)TARGET?))(3A)MAMMAL#)
L103            QUE  ((WOOD(W)(MOUSE OR MICE)) OR ARVICOLA?)
L104            QUE  (MEADOW#(W)VOLE#)
L105            QUE  (L95-L104)

EXISTING ECOTOX PROFILE [L171]

L106            QUE  (ECOTOX? OR LC50 OR ((LC OR EC OR LR)(W)50) OR EC50 OR
LR50)
L107            QUE  (ECO OR ECOL OR ECOLOG? OR ENV OR ENVIRONM? OR
AQUATIC?)
L108            QUE  (L107(5A)(TOX? OR RISK? OR IMPACT? OR EFFECT?))
L109            QUE  (AQUATIC? OR FRESHWATER? OR (FRESH(W)WATER?))
L110            QUE  (FLORA OR FAUNA  OR BIOTA OR ORGANISM? OR INSECT?)
L111            QUE  (ENVIRONM? OR LIFE OR INVERTEB? OR CRUSTACE? OR
SPECIES)
L112            QUE  (ENTOMOFAUNA OR (ENTOMO(W)FAUNA))
L113            QUE  (L109(5A)(L110 OR L111 OR L112))
L114            QUE  (MAGNA? OR (D(W)MAGNA?) OR CHIRONOM? OR BRACHIONUS?)
L115            QUE  (LIMNEA? OR CRASSOSTREA? OR ALGA# OR FISH OR FISHES)
L116            QUE  (ONCORHYNCHUS? OR SALMONIDAE? OR CYPRINUS? OR
CYPRINID?)
L117            QUE  (PIMEPHALES? OR PISCES OR TROUT OR SUNFISH? OR CARP)
L118            QUE  (MINNOW? OR (F(W)MINNOW?) OR CATFISH? OR ZEBRAFISH?)
L119            QUE  (GOLDFISH? OR (ZEBRA(W)DANIO#) OR GUPPY OR GUPPIES)
L120            QUE  (KILLFISH? OR FATHEAD? OR BLUEGILL? OR SALMON#)
L121            QUE  (THUNDERFISH? OR (WATER(W)(FLY OR FLEA?)) OR
WATERFLEA?)
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Search Strategy		
L122	QUE	(FROG# OR AMPHIBIA? OR SHRIMP# OR PRAWN# OR CRAB# OR TOAD#)
L123	QUE	(TADPOLE# OR CRAYFISH? OR SHELLFISH? OR LOBSTER#)
L124	QUE	(OYSTER# OR SNAIL# OR RANA OR RANIDAE? OR PLANKTON?)
L125	QUE	L106 OR L108
L126	QUE	((NONTARGET? OR (NON(W)TARGET?))(5A)(PLANT? OR FLORA?))
L127	QUE	((AQUATIC(3A)(PLANT? OR (PHYTO(W)TOX?) OR PHYTOTOX?)))
L128	QUE	(SEDIMENT? OR HYDROSOIL? OR DUCKWEED? OR PONDWEED?)
L129	QUE	(((DUCK OR POND)(W)WEED#) OR MACROPHYT? OR PERIPHYTON?)
L130	QUE	(POTAMOGETON? OR CHAROPHYTA? OR ELODEA? OR HYDROCHARITA?)
L131	QUE	(CERATOPHYL? OR CHLAMYDOMON? OR SELENASTRUM? OR CHLORELLA?)
L132	QUE	(SCENEDESMUS? OR SKELETONEMA? OR NAVICULA? OR ANABAENA?)
L133	QUE	(MYRIOPHYLLUM? OR GLYCERIA?)
L134	QUE	(NONTARGET? OR (NON(W)TARGET?) OR BENEFICIAL?)
L135	QUE	(EFFECT? OR INVERTEB? OR ORGANISM? OR ARTHROPOD? OR INSECT?)
L136	QUE	(FAUNA OR SPECIES OR (ENTOMO(W)FAUNA?) OR ENTOMOFAUNA?)
L137	QUE	((L134(5A)(L135 OR L136)))
L138	QUE	(PREDAT? OR (NATURAL(W)ENEM?) OR BEE OR BEES OR HONEYBEE#)
L139	QUE	(BUMBLEBEE# OR ((HONEY OR BUMBLE)(W)BEE#) OR EARTHWORM?)
L140	QUE	((EARTH(W)WORM?) OR LADYBUG# OR LADYBEETLE# OR LADYBIRD#)
L141	QUE	((LADY(W)(BUG# OR BEETLE# OR BIRD#)) OR HOVERFLY)
L142	QUE	(HOOVERFLIES OR SAWFLY OR SAWFLIES OR DRONEFLY)
L143	QUE	(DRONEFLIES OR FLOWERFLY OR FLOWERFLIES OR LACEWING?)
L144	QUE	(((HOVER OR DRONE OR FLOWER OR SAW)(W)(FLY OR FLIES)))
L145	QUE	(SPIDER# OR SPRINGTAIL? OR (ROOT(W)WORM#) OR ROOTWORM#)
L146	QUE	(L137-L145)
L147	QUE	(BIRD? OR AVES OR AVIAN? OR (AVI(W)FAUNA?) OR AVIFAUNA?)
L148	QUE	(SONGBIRD? OR (SONG(W)BIRD?) OR ORNITHOLOG?)
L149	QUE	(L147 OR L148)
L150	QUE	((WILD(3A)(LIFE OR ANIMAL#)) OR WILDLIFE OR SQUIRREL?)
L151	QUE	(VOLE# OR SCIURUS OR GLIRID? OR GLIS OR DORMOUSE)
L152	QUE	(DORMICE OR ELIOMYS OR LEROT# OR MUSTELID? OR MINK#)
L153	QUE	(MUSTELINE# OR WEASEL? OR STOAT? OR MUSTEL? OR BADGER?)
L154	QUE	(MELES OR MELINAE OR OTTER# OR LUTRA OR LUTRINAE)
L155	QUE	(LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS OR HARE#)
L156	QUE	(TALPA OR MOLE OR MOLES OR HEDGEHOG? OR (HEDGE(W)HOG?))
L157	QUE	(CROCIDURA? OR SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS)
L158	QUE	(MICROTUS OR ARVICOLA OR CLETHRIONOMYS? OR CRICETIDAE?)
L159	QUE	(ERINACEUS OR ERINACEIDAE? OR SORICIDAE? OR SOREX)
L160	QUE	(ENDOCRIN? OR HORMON?)
L161	QUE	(DISRUPT? OR MIMIC? OR MODULAT? OR DISORDER? OR DISEASE?)
L162	QUE	(L160(5A)L161)
L163	QUE	(DAPHNI? OR CERIODAPHNI? OR HYALELLA? OR ASSELLUS)
L164	QUE	(L113-L124) OR L163
L165	QUE	(PHYTOPLANKTON? OR AUFWUCH# OR LEMNA? OR ARALES OR CHARA)
L166	QUE	(L126-L129) OR (L130-L133) OR L165
L167	QUE	(NEOMYS OR MICROTINAE?)

Search Strategy		
L168	QUE	(L150-L159) OR L167
L169	QUE	(LOACH? OR STICKLEBACK? OR MUMMICHOG# OR TILAPIA? OR ASELLUS)
L170	QUE	L164 OR L169
L171	QUE	L125 OR L170 OR L166 OR L146 OR L149 OR L168 OR L162
L172	**QUE**	**(L1-L48)**
L173	**QUE**	**(L171 OR L172 OR L94 OR L105) TOTAL PROFILE**

Table 2.4-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	138
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		82 (1)
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		0
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		2
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		2
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		45 (2)

Provider	Database	Justification	Limits applied	Number*
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		15
	HCAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		148 (1)
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		0
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		3 (2)
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		1

Provider	Database	Justification	Limits applied	Number*
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (searches 1-5 only).		1
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		6
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		0

* Total number of summary records retrieved after removing duplicates, number in parenthesis is number in Search 4

Table 2.4-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.4-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.5 Environmental Fate

Table 2.5-1: Detailed Search Parameters for Fate and behaviour in the environment (CA 7.1.1 to 7.5)

Search Strategy
Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (FATE# OR DEGRAD? OR PERSIST? OR DECOMP? OR DECAY?) L2 QUE (TRANSFORM? OR DETERIORAT? OR METAB? OR DEGENERAT?) L3 QUE (BIODEGRAD? OR BIOTRANSFORM? OR BIODETERIORAT?) L4 QUE (BIODEGENERAT? OR BREAKDOWN? OR BREAKSDOWN?) L5 QUE (((BROKEN? OR BREAK?)(W)(UP OR DOWN)) OR HALFLIFE#) L6 QUE (HALFLIVES OR HALF(W)(LIFE OR LIVES) OR DEGRDN# OR DECOMPN#) L7 QUE (BIODEGRDN# OR DEGN# OR BIODEGN# OR DISSIP? OR RESIDUE?) L8 QUE (LEACH? OR TRANSPORT? OR MOBIL? OR MOVEMENT? OR HYDROLY?) L9 QUE (ADSORP? OR ADSORB? OR SORP? OR SORB? OR DESORP?) L10 QUE (DESORB? OR RUNOFF OR (RUN#(W)OFF) OR DRAIN? OR PERCOLAT?) L11 QUE (WASHOFF? OR WASHOUT? OR (WASH?(W)(OUT OR OFF))) L12 QUE ((((OFF(W)TARGET) OR LATERAL OR HORIZONTAL)(3W)MOVE?)) L13 QUE (PHOTOLY? OR PHOTODEGRAD? OR PHOTODECOMP?) L14 QUE (PHOTOTRANSFORM? OR PHOTOSTAB? OR PHOTODEGRDN# OR PHOTODEGN#) L15 QUE ((PHOTO(W)(DECOMP? OR DEGRAD? OR TRANSFORM? OR STAB? OR CHEM?))) L16 QUE (PHOTOCHEM? OR VOLATIL? OR VAPOUR? OR VAPOR? OR DT50 OR DT90) L17 QUE ((DT(W)50) OR (DT(W)90) OR KDOC OR (K(W)DOC) OR KD OR KOC) L18 QUE ((K(W)OC) OR (PARTITION?(3W)COEFF?) OR FREUNDLICH) L19 QUE (SEDIMENT? OR SOIL OR SOILS OR PODZOL? OR CLAY? OR SAND?) L20 QUE (SILT? OR CHERNOZEM? OR PODSOL? OR LOAM? OR PEAT?) L21 QUE ((ORGANIC(2W)MATTER?) OR MONTMORIL? OR LATOSOL? OR HUMIC?) L22 QUE (HUMUS? OR SUBSOIL? OR AIR OR WATER? OR ATMOSPHER?) L23 QUE (RAIN### OR RAINWATER? OR RAINFALL? OR LEACH?) L24 QUE (GROUNDWATER? OR ENVIRONMENT? OR PRECIPITAT? OR POND#)

Search Strategy	
L25	QUE (STREAM# OR RIVER# OR DELTA# OR ESTUAR? OR SEDIMENT?)
L26	QUE (AQUATIC? OR MARINE? OR TIDAL? OR BENTHIC? OR LAKE#)
L27	QUE (BENTHOS? OR LIMNO? OR FRESHWATER? OR SEAWATER?)
L28	QUE (SALTWATER? OR ((GROUND? OR FRESH OR SEA OR SALT)(W)WATER?))
L29	QUE (LACUSTRINE? OR MIRE OR MIRES OR RESERVOIR# OR CANAL#)
L30	QUE (LOCH# OR SEA OR OCEAN OR OCEANS OR LAGOON? OR SEAS)
L31	QUE (SEABED OR SEAFLOOR OR INTERTIDAL? OR SHORE? OR COAST?)
L32	QUE (BRACKISH OR LITTORAL? OR SEASHORE? OR MEIOBENTH?)
L33	QUE (MICROBENTH? OR MACROBENTH? OR HARBOUR# OR FLUVIAL?)
L34	QUE (MARSH? OR BOG OR BOGS OR SWAMP? OR FEN OR FENS OR ALLUVI?)
L35	QUE (MUDFLAT? OR (MUD(W)FLAT?) OR BAY OR BAYS OR CREEK#)
L36	QUE (HYDROSOIL# OR (HYDRO(W)SOIL#) OR MESOCOSM? OR MICROCOSM?)
L37	QUE (WETLAND? OR FENLAND? OR ((WET OR FEN)(W)LAND?))
L38	QUE (WATERWAY? OR WATERSHED? OR (WATER(W)(WAY? OR SHED?)))
L39	QUE (CATCHMENT? OR DITCH? OR DRAIN# OR DRAINAG?)
L40	QUE (((FOLIAGE OR FOLIAR OR LEAF OR LEAVES)(5A)EVAPORAT?))
L41	QUE ((SPRAY? OR DUST?)(3A)DRIFT)
L42	QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23 OR L24 OR L25 OR L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR L33 OR L34 OR L35 OR L36 OR L37 OR L38 OR L39 OR L40 OR L41)

Table 2.5-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	186 (1)
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		55 (0)
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		0 (0)
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		0 (0)
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		1 (0)
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		19 (0)
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		16 (3)

Provider	Database	Justification	Limits applied	Number*
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		734 (11)
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0 (0)
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		0 (0)
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0 (0)
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0 (1)
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		2 (2)

Provider	Database	Justification	Limits applied	Number*
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (searches 1-5 only).		9 (0)
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		63 (3)
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		2 (1)

* Total number of summary records retrieved after removing duplicates in Search 1, number in parenthesis is number in Search 4

Table 2.5-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.5-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table 2.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Document Title

Literature Search
Triazole Derivative Metabolites,
Being Common Metabolites of Triazole-Fungicides

Data requirement

EU Regulation 1107/2009 & EU Regulation 283/2013
Document MCA
Section 9: Literature data

According to the Guidance Document SANCO/10181/2013, for preparing dossiers for the approval of a chemical active substance

Version 8

Date

10th July 2024

Owner

Triazole Metabolite Derivatives Group (TMDG)

BASF SE, Bayer AG, Corteva Agriscience LLC, Gowan Crop Protection Ltd, Syngenta

Content modified for submission by Syngenta Japan K.K.

19th September 2024

OWNERSHIP STATEMENT

Version history[1]

Date	Data points containing amendments or additions and brief description	Document identifier and version number

[1] It is suggested that applicants adopt a similar approach to showing revisions and version history as outlined in SANCO/10180/2013 Chapter 4 How to revise an Assessment Report

Table of Contents

CA 9 LITERATURE DATA

A literature search was carried out covering the four common triazole metabolites, 1,2-4-triazole, triazole alanine, triazole acetic acid and triazole lactic acid, as required according to Article 8(5) of Regulation (EC) No 1107/2009. The literature search was performed in accordance to the provisions of the EFSA Guidance "Submission of scientific peer-reviewed open literature for the approval of pesticide active substances under Regulation (EC) 1107/2009".

The objective of this literature search document was as a supplement to the previous literature search document, Version 7 of 3rd July 2020 which covers the period 9th June 2004 until 23rd March 2020. This previous document has been submitted to a number of EU Member States with various parent triazole dossiers from 2014 onwards.

This current literature search covers the period 23rd March 2020 – 2nd February 2024 and is the assessment of scientific peer-reviewed open literature dealing with the four common triazole metabolites listed above.

History

This literature search is performed for and owned by the Triazole Derivatives Metabolite Group (TDMG), a task force consisting of five companies, BASF SE, Bayer AG, Corteva Agriscience LLC, Gowan Crop Protection Ltd and Syngenta. These five companies have interests in a number of parent triazole fungicide compounds. The parent triazoles have common metabolites and historically the companies have formed a cooperation to share data and avoid duplicate testing. The TDMG also license data to license holders particularly to avoid duplicate animal testing.

CA 9.1 Summary

This report summarises the search for "scientific peer-reviewed open literature on the four common triazole metabolites, 1,2-4-triazole (124T), triazole alanine (TA), triazole acetic acid (TAA) and triazole lactic acid (TLA), dealing with all sections of the dossier and (together with the previously submitted literature search version 6) published within the last sixteen years before the date of submission of the dossier" in accordance with Article 8(5) of Regulation (EC) No. 1107/2009. This version covers strictly from **23rd March 2020 until 2nd February 2024**.

The exact search strategy is detailed in Appendix 1 and 2 but a summary of the methodology employed is given below.

- A very broad search was conducted in a number of scientific source databases (detailed in Appendix 2) for using the search terms listed in Appendix 1.
- Duplicate titles from within each database were automatically removed from the output.
- A rapid relevance assessment of the titles was conducted to remove any additional duplicates between databases and any obviously irrelevant titles (where enough information was available from the title alone).
- Summary abstracts were requested for the remaining titles and a further rapid relevance assessment was conducted where again any clearly irrelevant titles were removed.

- A detailed assessment of the full-text documents for the remaining publications was conducted using the criteria listed in Appendix 1 developed for study relevance

- Any relevant papers were highlighted and assessed for reliability.

An overview of the results is summarised in the table below.

Summary of the review	**Number** **Search: 23rd March 2020 until 2nd February 2024**
Total number of summary records retrieved after removing duplicates from all database searches	1737
Total number of summary records per dossier section search filter	Physical chemistry 199 Toxicology 499 Metabolism and residues 368 Ecotoxicology 129 Environmental fate 542
Number of summary records excluded after rapid assessment* for relevance (by title/abstract)	Physical chemistry 180 Toxicology 458 Metabolism and residues 341 Ecotoxicology 110 Environmental fate 489
Number of summary records excluded after expert assessment for relevance* (by title/abstract i.e. not relevant)	Physical chemistry 19 Toxicology 39 Metabolism and residues 25 Ecotoxicology 16 Environmental fate 44
Number of summary records for detailed assessment of full-text documents by expert (i.e. possibly relevant)	Physical chemistry 0 Toxicology 2 Metabolism and residues 2 Ecotoxicology 3 Environmental fate 9
Number of studies excluded from the risk assessment after detailed assessment of full-text documents (i.e. not relevant)	Physical chemistry 0 Toxicology 2 Metabolism and residues 2 Ecotoxicology 3 Environmental fate 8
Number of studies not excluded for relevance after detailed assessment (i.e. reliable studies and studies of unclear reliability)	Environmental fate 1

* aligned with EFSA Journal 2011; 9(2):2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles, and titles plus abstracts.

CA 9.2 Search strategy

The search strategy is as outlined below with further detail specified, per section, in Appendix 1 and 2.

CA 9.2.1 Date of the search

The table below gives the relevant dates of the searches conducted from Version 6 of this document, Version 7 and this update Version 8:

Previous literature search documents	**Version 6 & Version 7**
Date of search 1	10th January 2004 - 10th January 2014
Date of search 2	10th June 2015
Date span of the search 2	10th January 2014 – 9th June 2015
Date of search 3	19th November 2015
Date span of the search 3	10th June 2015 – 18th November 2015
Date of search 4	20th January 2016
Date span of the search 4	19th November 2015 – 20th January 2016
Date of search 5	15th August 2016
Date span of the search 5	20th January 2016 – 15th August 2016
Date of search 6	19th March 2018
Date span of the search 6	15th August 2016 – 19th March 2018
Date of search 7	7th December 2018
Date span of the search 7	20th March – 7th December 2018
Date of search 8	10th April 2019
Date span of the search 8	8th December 2018 – 10th April 2019
Date of search 9	23rd March 2020
Date span of the search 9	10th April 2019 – 23rd March 2020
Current Literature search document	**Version 8**
Date of search 10	2nd February 2024
Date span of the search 10	23rd March 2020 – 2nd February 2024

The previous literature search documents have been submitted to support the review of TDMG parent triazole active substances in various EU Member States as detailed below.

Date	**Parent Triazole Submission**	**RMS**
July 2014	Propiconazole	Finland
Oct 2015	Metconazole	Belgium / UK
Oct 2015	Triticonazole	Austria / UK

Jan 2016	Prothioconazole	UK / France
Mar 2016	Mefentrifluconazole	UK / France
June 2016	Difenconazole	Spain / UK
February 2017	Tebuconazole	UK / Denmark
June 2019	Tetraconazole Penconazole	France /Germany Norway / Germany
August 2020	Paclobutrazol	Austria / Romania

CA 9.2.2 Time window of the literature search

In line with Article 8(5) of Regulation (EC) No 1107/2009 scientific peer-reviewed open literature from 2004 onwards covering more than just the last 10 years prior to the various parent triazole active substance dossier submission dates has been assessed. The initial searches until April 2019 have been summarised in the literature search document Version 6. There is a Version 7 covering the top up search to March 2020 and now this Version 8 covering the top up search up to February 2024.

Literature search document	**Version 8**
Date of search 10	2nd February 2024
Date span of the search 10	23rd March 2020 – 2nd February 2024

CA 9.2.3 Bibliographic Databases used in the literature review

The bibliographic databases selected cover a wide range of scientific fields and include journals and chapters in books or symposia, conference proceedings, dissertations and reports. All databases were searched using the search strategy given in CA 9.2 combined with the end point specific search terms given in CA 9.2.5 as a single concept approach.

Databases	**Frequency of updates**	**Date of last update**
MEDLINE	1948 to present; 5 times each week with an annual reload	2024-02-01
EMBASE	1974 to present; Updated daily	2024-02-01
ESBIOBASE	1994 to 2022; static file since 2022-01-05	2022-01-05
AGRICOLA	1970 to present; Updated monthly	2023-12-08
BIOSIS	1926 to present; Updated weekly	2024-01-31
CABA	1973 to present; Updated weekly	2024-01-29
HCAPLUS/	1907 to present; Updated daily	2024-02-01
FSTA	1969 to present; Updated weekly	2024-02-02
GEOREF	1669 to present; Updated twice a month	2024-02-02
TOXCENTER	1907 to present; Updated weekly	2024-01-29
PQSCITECH	1962 to present; Updated monthly	2024-01-30
SCISEARCH	1974 to present; Updates weekly	2024-01-29
ANABSTR	1980 to 2021; static file since 2021-12-14	2021-12-14

CA 9.2.4 Input parameters for literature search

Detailed search parameters - Chemical Names and CAS numbers. The following were searched for;

1,2,4-Triazole (CAS: 288-88-0)
Chemical Names:
1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)-
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name)
1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)-
1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI)
1H-1,2,4-Triazole-1-acetic acid (CA Index Name)
1,2,4-Triazol-1-ylacetic acid
1,2,4-Triazole-1-acetic acid
1H-1,2,4-Triazol-1-ylacetic acid
2-(1,2,4-Triazol-1-yl) acetic acid
2-(1H-1,2,4-Triazol-1-yl) acetic acid
1H-1,2,4-Triazole (CA Index Name)
s-Triazole (8CI)
3,4-Diazapyrrole
4H-1,2,4-Triazole

Using these following parameters dealing with the structure specific search terms;

L1 QUE SPE=ON ABB=ON PLU=ON (288-88-0 OR 1450828-63-3 OR 28711-29-7 OR 333354-47-5 OR 86362-20-1 OR 114419-45-3 OR 4819-36-7 OR 25167-73-1 OR 27236-77-7 OR 116421-29-5 OR 1001118-18-8)

L2 QUE SPE=ON ABB=ON PLU=ON (1,2,4-TRIAZOL-1-YLACETIC ACID OR 1(W)2(W)4(W)TRIAZOLE(W)1(W)ACETIC(W)ACID) OR (1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID) OR (2(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID) OR (2(2W)1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)

L3 QUE SPE=ON ABB=ON PLU=ON ((1H(2W)1(W)2(W)4(W)TRIAZOLE) OR (S(W)TRIAZOLE)) OR ((3(W)4(W)DIAZAPYRROLE) OR (4H(2W)1(W)2(W)4(W)TRIAZOLE)) OR (3(2W)1H(W)1(W)2(W)4(W)TRIAZOL#(W)1(W)YL(W)ALANINE)

L4 QUE E=ON ABB=ON PLU=ON (1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPANOIC(W)ACID) OR (1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPIONIC(W)ACID)

L5 QUE SPE=ON ABB=ON PLU=ON ((2(W)HYDROXY(W)3)(2W)(L4))

L6 QUE SPE=ON ABB=ON PLU=ON ((ALPHA(W)(HYDROXY OR AMINO))(3A)(L4))

L7 QUE SPE=ON ABB=ON PLU=ON (HYDROXY(4W)TRIAZOLE(1W)PROPANOIC ACID OR AMINO(4W)TRIAZOLE(1W)PROPANOIC ACID OR TRIAZOLE(1W)ACETIC ACID OR TRIAZOL(1W)YLACETIC ACID OR TRIAZOL(1W)YL ACETIC ACID OR AMINO(4W)TRIAZOLE(1W)PROPIONIC ACID OR DIAZAPYRROLE OR NSC(W)83128 OR NSC83128)

CA 9.2.5 Endpoint specific search terms

The endpoint specific search terms were specified for each dossier section and are clearly stated in Appendix 2.

CA 9.2.6 Filters

The four common triazole metabolites 1,2,4 triazole (124T), triazole alanine (TA), triazole acetic acid (TAA) and triazole lactic acid (TLA) were searched for as described above and in Appendix 1 and 2 across multiple data bases. The results, returned from the "single concept search" for each database, were then checked for duplicates which were removed. The searches were then filtered using the search terms specific to a technical aspect, namely physical chemical properties, toxicology, metabolism and residues, ecotoxicology and environmental fate (refer to Appendix 1 and 2).

CA 9.3 Search results

The results for the top up search of the four triazole metabolites are detailed in Table 9.3-1. The results split across the databases are detailed in Table 9.3-2.

Table 9.3-1

Data requirement(s) captured in the search	Physical Chemistry	Toxicology	Metabolism and Residues	Ecotoxicology	Environmental Fate
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	199	499	368	129	542
Number of *summary records* excluded from the search results after rapid assessment for relevance**	199	497	366	126	533
Total number of *full-text* documents assessed in detail*	0	2	2	3	9
Number of *studies* excluded from further consideration after detailed assessment for relevance	0	2	2	3	8
Number of *studies* not excluded for relevance after detailed assessment (i.e. relevant studies and studies of unclear relevance)	0	0	0	0	1

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

Table 9.3-2

Dossier Section	Database	Number of unique answers retrieved (after removal of duplicates and manual removal of false positives due to the query being too unspecific).
Physical Chemistry	Medline	16
	SciSearch	2
	Toxcenter	19
	CAplus	162
Toxicology	Medline	117
	SciSearch	1
	Toxcenter	218
	CAplus	155
	BIOSIS	2
	FSTA	2
	Agricola	1
	EMBASE	1
	Esbiobase	1
	GeoRef	1

Metabolism and Residues	Medline	93
	SciSearch	1
	Toxcenter	93
	EMBASE	2
	BIOSIS	1
	Esbiobase	1
	FSTA	2
	GeoRef	1
	CAplus	174
Ecotoxicology	Medline	46
	SciSearch	1
	Toxcenter	35
	EMBASE	1
	BIOSIS	2
	CABA	1
	GeoRef	1
	CAplus	42
Environmental Fate	Medline	90
	SciSearch	3
	Toxcenter	135
	EMBASE	2
	BIOSIS	2
	Esbiobase	1
	FSTA	2
	GeoRef	1
	CAplus	304
	PQSciTech	1
	Agricola	1

CA 9.4 Evaluation

The evaluation of the search results is performed according to the EFSA guidance document (EFSA Journal 2011;9(2):2092).

Studies **relevant** to the dossier are those that inform one or more data requirement(s), including hazard identification, hazard characterisation and exposure assessment, for the active substance under assessment, its relevant metabolites, or plant protection products.

This section considers the physical chemical properties, toxicology, metabolism and residue, ecotoxicology and environmental fate data requirements for chemical active substance and plant protection products and other data requirements for which information may have a direct or indirect effect on overall risk assessment (only data requirements under these points having a direct impact on the risk assessment need to be considered).

If a detailed assessment of the study/article was required to determine relevance, the full paper has been provided in KCA Section 9 (and is listed in LCA Section 9).

In case of relevant studies/articles, the full paper is provided and a detailed summary is included in the respective MCA Section.

The scientific peer-reviewed open literature provided with this dossier is protected by Copyright. The TDMG member lead applicant, has secured the right to use, reproduce and share copies of these publications with the required Regulatory Authorities for the purpose of Regulatory decision making. Further use, reproduction or sharing of these copies by a Rapporteur Member State or EFSA for any purpose other than this is prohibited. Should a Regulatory Authority require a copy of the literature provided, a request should be submitted to the applicant.

CA 9.4.1 Rapid assessment

For the initial rapid assessment, titles were first scanned to identify whether the studies were obviously not relevant. If enough information was available from the title alone to determine that studies were clearly irrelevant, the titles were disregarded. Summary abstracts were then requested for the remaining titles and a further rapid assessment was conducted, where again any irrelevant studies were removed. Any studies clearly not in the remit of this submission or unambiguously belonging to other sections were excluded.

For the rapid assessment of titles and abstracts the criteria listed in Appendix 1 were applied to assess the publication as being clearly irrelevant – if it was not clear from the title or abstract whether the paper was relevant then the full paper was read and detailed in Table 9.4.2-1.

So from a total of 1737 summary records retrieved, all were excluded except just sixteen deemed in need of full assessment.

Table 9.4.2-1

Data requirement(s) captured in the search	Physical Chemistry	Toxicology	Metabolism and Residues	Ecotoxicology	Environmental Fate
Total number of *summary records* retrieved after *all** searches of peer-reviewed literature (excluding duplicates)	199	499	368	129	542
Number of *summary records* excluded from the search results after rapid assessment for relevance**	199	497	366	126	533
Total number of *full-text* documents assessed in detail*	0	2	2	3	9

*both from bibliographic databases and other sources of peer-reviewed literature
** aligned with EFSA Journal 2011; 9(2) 2092: rapid assessment means exclusion of "obviously irrelevant records" based on titles.

CA 9.4.2 Detailed assessment

With 1720 articles in total excluded at the rapid assessment, 16 articles in total remained which underwent detailed assessment based on the full-text document. These 16 articles were evaluated for relevance using the relevance criteria mentioned in Table Appendix 1: List of Criteria for relevance. No documents were considered for Physical Chemistry, 2 documents were considered for Toxicology, 2 documents for Metabolism & Residues, 3 for Ecotoxicology and 9 for Environmental Fate.

Table 9.4.2-1: Publications excluded from the risk assessment after detailed assessment of full-text documents

Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)*
Top-up search conducted in 23rd March 2020 to 2nd February 2024				
Sun, Long; Wang, Kangquan; Li, Wenze; Pang, Xiaohui; Zhao, Pengfei; Hua, Rimao; Yang, Xiaofan; Zhu, Meiqing	2023	Enantioselective effects of chiral prothioconazole and its metabolites: Oxidative stress in HepG2 cells and lysozyme activity	Pesticide Biochemistry and Physiology, (2023) Vol. 197, pp. 105696. CODEN: PCBPBS. ISSN: 0048-3575.	The abstract suggested potential new toxicity data to be available for certain metabolites of prothioconazole without providing details. The check of the complete publication revealed that no data on triazole derivate metabolites (TDMs) 1,2,4-triazole (1,2,4-T), triazole acetic acid (TAA) was contained in the publication. The publication does not provide any new toxicologically new information on TDMs and is therefore not relevant for inclusion in the dossier. DAを行ったが、RA①当該農薬と関係しない論文
Huang Tao; Jiang Haibo; Zhao Yuanhui; He Jia; Cheng Hongguang; Martyniuk Christopher J	2022	A comprehensive review of 1,2,4-triazole fungicide toxicity in zebrafish (Danio rerio): A mitochondrial and metabolic perspective.	The Science of the total environment, (2022 Feb 25) Vol. 809, pp. 151177. Electronic Publication Date: 23 Oct 2021	It was not clear from the abstract if the publication contains toxicological information on triazole derivate metabolites (TDMs) 1,2,4-triazole (1,2,4-T), triazole acetic acid (TAA). The check of the complete publication revealed that no toxicity data on TDMs is contained in the publication. The publication is therefore not relevant for inclusion in the dossier. DAを行ったが、RA①当該農薬と関係しない論文

Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)*
Hergueta-Castillo, M.E. et al.	2023	Understanding the metabolism and dissipation kinetics of Flutriafol in vegetables under laboratory and greenhouse scenarios	Foods 2023, 12, 201	The paper discusses the use of UHPLC-Q-Orbitrap to assess flutriafol dissipation and some metabolite identification in courgette and tomato. The conclusions do not bring any new information to the already existing evaluations of TDMs, and is therefore considered not relevant for inclusion in the dossier. DAを行ったが、RA⑤分析法に関する論文（分析対象としてトリアゾール共通代謝物を含むが、フルトリアホールを処理した試験でありヘキサコナゾールは用いていない。）
Hergueta-Castillo, M.E. et al.	2023	Dissipation of penconazole formulation in horticultural crops by ultrahigh performance liquid chromatography-high resolution mass spectrometry: from the active substance to metabolites	Food Chemistry 422 (2023) 136266	The paper discusses the use of UHPLC-Q-Orbitrap to assess penconazole dissipation and metabolite identification in courgette and tomato. The conclusions do not bring any new information to the already existing evaluations of TDMs, and is therefore considered not relevant for inclusion in the dossier. DAを行ったが、RA⑤分析法に関する論文（分析対象としてトリアゾール共通代謝物を含むが、ペンコナゾールを処理した試験でありヘキサコナゾールは用いていない。）
Nath Aniket; De Priyanka; Roy Kunal	2021	In silico modelling of acute toxicity of 1, 2, 4-triazole antifungal agents towards zebrafish (Danio rerio) embryos: Application of the Small Dataset Modeller tool.	Toxicology in vitro : an international journal published in association with BIBRA, (2021 Sep) Vol. 75, pp. 105205. Electronic Publication Date: 26 Jun 2021	The paper describes the models available using in silico techniques through Small Dataset Modeller tool, for potential assessment capabilities for evaluating toxicity to zebrafish from exposure to antifungal agents. Modelling potential on aquatic systems and no data generated which is deemed to impact on classifications or risk assessments of any current registered active ingredient toxicity profiles. DAを行ったが、RA⑮ドライラボのみの論文
Pandey, Sapna Kumari; Ojha, Probir Kumar; Roy, Kunal	2020	Exploring QSAR models for assessment of acute fish toxicity of environmental transformation products of pesticides (ETPPs)	Chemosphere, (2020) Vol. 252, pp. 126508. CODEN: CMSHAF. ISSN: 0045-6535.	The paper describes the calculation models available using QSAR, for potential assessment capabilities for evaluating toxicity to fish from exposure to environmental transformation products of pesticides (ETPPs) modelling on aquatic systems and no data generated which is deemed to impact on classifications or risk assessments of any current registered active ingredient toxicity profiles. DAを行ったが、RA⑮ドライラボのみの論文
Hernandez-Moreno, D.; Blazquez, M.; Navas, Jm; Fernandez-Cruz, Ml	2022	Fish cell lines as screening tools to predict acute toxicity to fish of biocidal active substances and their relevant environmental metabolites	Aquatic Toxicology, (2022) Vol. 242, pp. 106020. CODEN: AQTODG. ISSN: 0166-445X.	The paper reviewed possible techniques to predict expected endpoints if active substances and metabolites in fish. No actual generated endpoints and thus it is not deemed to impact the classifications or risk assessments of any current registered active ingredient toxicity profiles. DAを行ったが、RA①新しい評価方法の開発に関する論文であり、当該農薬の評価に関係しない。

Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)*
Ni, Zhigang; Chen, Zhi; Zhang, Xuewei; Yang, Xuerui; Zhou, Lei	2023	Photolysis of fungicide triadimefon: A combined experimental and theoretical investigation on homolytic C-O and C-N bonds dissociation mechanisms	Journal of Photochemistry and Photobiology, A: Chemistry (2023), 436, 114402	Interesting paper on the photodegradation mechanism of the triazole triadimefon, based on a combined experimental and theoretical strategy. Irrelevant to the fate and behaviour of the four common triazole metabolites themselves. DAを行ったが、RA①当該農薬と関係しない論文
Martinez-Escudero, C. M.; Garrido, I.; Ros, C.; Flores, P.; Hellin, P.; Contreras, F.; Fenoll, J.	2023	Remediation of pesticides in commercial farm soils by solarization and ozonation techniques	Journal of Environmental Management (2023), 329, 117062	The paper demonstrates the efficiency of solarization-ozonation treatment techniques for the removal of twelve pesticides at full scale. No relevant information on the behaviour of the four common triazole metabolites in the environment. DAを行ったが、RA⑬土壌からの農薬の除去法の開発に関する論文であり検索対象である4分野に関係しない。
Martinez-Escudero, C. M.; Garrido, I.; Flores, P.; Hellin, P.; Contreras-Lopez, F.; Fenoll, J.	2022	Remediation of triazole, anilinopyrimidine, strobilurin and neonicotinoid pesticides in polluted soil using ozonation and solarization	Journal of Environmental Management, (2022) Vol. 310, pp. 114781.	The paper aims to investigate the effectiveness of ozonation and solarization techniques for the removal of different types of pesticides from soil during the summer season. No relevant information on the behaviour of the four common triazole metabolites in the environment. DAを行ったが、RA⑬土壌からの農薬の除去法の開発に関する論文であり検索対象である4分野に関係しない。
Neuwald, Isabelle J.; Huebner, Daniel; Wiegand, Hanna L.; Valkov, Vassil; Borchers, Ulrich; Noedler, Karsten; Scheurer, Marco; Hale, Sarah E.; Arp, Hans Peter H.; Zahn, Daniel	2022	Occurrence, distribution, and environmental behavior of persistent, mobile, and toxic (PMT) and very persistent and very mobile (vPvM) substances in the sources of German drinking water	Environmental Science and Technology, (2022) Vol. 56, No. 15, pp. 10857-10867.	The paper looks at 34 PMT/vPvM substances in 46 surface water, groundwater, bank filtrate, and raw water samples throughout Germany. Not relevant for fate of triazole metabolites considered in this search. In fact, 1,2,4-T is the only metabolite of interest monitored in this paper and it was found in a low number of samples, reducing the robustness of any conclusion. In addition, exact locations of the samplings were not specified due to confidentiality, therefore no adequate site characterization data is available (soils, geology, hydrology). DAを行ったが、DA②日本の代表的な使用方法／使用条件における評価に活用できない文献
Skaarup, Carina; Wodschow, Kirstine; Voutchkova, Denitza D.; Schullehner, Jorg; Raaschou-Nielsen, Ole; Andersen, Helle Raun; Hansen, Birgitte; Ersboell, Annette Kjaer	2022	Geographical Distribution and Pattern of Pesticides in Danish Drinking Water 2002-2018: Reducing Data Complexity	International Journal of Environmental Research and Public Health (2022), 19(2), 823	Extensive screen of Danish Drinking Water for multiple pesticides. Very generic. No relevant information on 1,2,4- T behaviour in the environment. Exact locations of the samplings are not clear in the paper, therefore no adequate site characterization data is available (soils, geology, hydrology). There are in addition limitations linked to the frequency and stability of the samplings. DAを行ったが、DA②日本の代表的な使用方法／使用条件における評価に活用できない文献

Author(s)	Year	Title	Source	Reason for not including publication in dossier (based on relevance and reliability criteria)*
Albers, Christian Nyrop; Johnsen, Anders Risbjerg; Bollmann, Ulla Elisabeth	2023	Urban areas as sources of the groundwater contaminants N,N-dimethylsulfamide (N,N-DMS) and 1,2,4-triazole	Science of the Total Environment, (2023) Vol. 881, pp. 163377.	The study presents analysis of urban groundwater and investigates if detection of 1,2,4-T can originate from urban usage and not agricultural applications. The monitored soils and groundwaters are not agricultural. No conclusions on the fate of behaviour of 1,2,4- T originating from agricultural activities can therefore be made. DA②日本の代表的な使用方法／使用条件における評価に活用できない文献
Ismanto, Aris; Hadibarata, Tony; Kristanti, Risky Ayu; Maslukah, Lilik; Safinatunnajah, Novia; Sathishkumar, Palanivel	2022	The abundance of endocrine-disrupting chemicals (EDCs) in downstream of the Bengawan Solo and Brantas rivers located in Indonesia	Chemosphere, (2022) Vol. 297, pp. 134151. CODEN: CMSHAF. ISSN: 0045-6535.	This study is a monitoring study assessing surface quality in downstream of the Bengawan Solo and Brantas rivers located in Indonesia. It is interesting to be reported as monitoring data. However, since - no details on typical pesticide application practices in the area are reported, no details on actual pesticide use in relation to the sampling locations are given. - the study lacks details such as information on geoclimatic conditions, hydrology and soil properties - There is evidence of 124T contamination originating from sources other than agricultural practices. In fact, the article reports that the rivers are used as garbage dumps by people living on the riverbanks. Therefore, the study cannot be considered relevant. DA①試験方法に関する情報が不足している②日本の代表的な使用方法／使用条件における評価に活用できない文献
Albers Christian Nyrop; Bollmann Ulla Elisabeth; Badawi Nora; Johnsen Anders Risbjerg	2022	Leaching of 1,2,4-triazole from commercial barley seeds coated with tebuconazole and prothioconazole	Chemosphere, (2022 Jan) Vol. 286, No. Pt 2, pp. 131819. Electronic Publication Date: 6 Aug 2021	This study uses commercial barley seeds coated with the triazole fungicides tebuconazole and Prothioconazole, to study the fate of the fungicides and their degradation products, especially 1,2,4-triazole. This is an interesting scientific paper, however, it doesn't change the endpoints or risk assessment for 1,2,4-triazole. The research used non-guideline tests using soil columns that only had a 10 cm depth. Additionally, contamination was observed in the control samples, raising questions on the reliability of results and conclusions. Therefore, the study cannot be considered relevant. DA②日本の代表的な使用方法／使用条件における評価に活用できない文献

*「公表文献の収集、選択等のためのガイドライン（令和 3 年 9 月 22 日農業資材審議会農薬分科会決定、令和 5 年 7 月 27 日一部改正）」に基づき、日本における第 2 段階評価結果を申請者が追記した。なお、RA は第一段階適合性評価、DA は第 2 段階適合性評価、〇囲み数字は前述のガイドラインに記載されている判断基準の項目番号を示す。

Table 9.4.2-2: Relevant studies included in the dossier after detailed assessment of full-text documents for relevance: sorted by data requirement(s)

Data requirement (indicated by the corresponding CA and CP data point number)	Author(s)	Year	Title	Source
Monitoring CA 7.5	Moeller, Ingelise; Karan, Sachin; Gravesen, Peter; Rosenbom, Annette Elisabeth	2023	On the representability of soil water samples in space and time: Impact of heterogeneous solute transport pathways underneath a sandy field	Science of the Total Environment (2023), 856(Part_1), 159039

Table 9.4.2-3: Relevant studies included in the dossier after detailed assessment of full-text documents for relevance: sorted by author(s)

Author(s)	**Data requirement (indicated by the corresponding CA and CP data point number)**	**Year**	**Title**	**Source**
Moeller, Ingelise; Karan, Sachin; Gravesen, Peter; Rosenbom, Annette Elisabeth	Monitoring CA 7.5	2023	On the representability of soil water samples in space and time: Impact of heterogeneous solute transport pathways underneath a sandy field	Science of the Total Environment (2023), 856(Part_1), 159039

CA 9.4.3 Overall Conclusion of Results

Sixteen documents, listed above, were assessed in detail for relevance by subject matter experts. Of those sixteen, all were deemed non-relevant except one.

One relevant Environmental Fate document was found from the search performed and summarised in this document. The summary as to relevance is presented below:

Table 9.4.3-1: Relevant studies included in the dossier after detailed assessment of full-text documents for relevance: sorted by author(s) and reason for relevance;

Author(s)	Year	Title	Source	Reason for relevance*
Moeller, Ingelise; Karan, Sachin; Gravesen, Peter; Rosenbom, Annette Elisabeth	2023	On the representability of soil water samples in space and time: Impact of heterogeneous solute transport pathways underneath a sandy field	Science of the Total Environment (2023), 856(Part_1), 159039	This paper studied the occurrence of pesticides and their degradation products, based on a detailed three-dimensional sedimentary facies model interpreted from geological and geophysical data combined with groundwater level measurements. It is considered relevant since: - 25 sampling sites were monitored for 19 years. - Sufficient information on geoclimatic conditions, hydrology and soil properties - The studied field represents typical pesticide application practices Can be included in the dossier MCA Section 7 against the data point CA 7.5 Monitoring Data. 適合性分類：C（日本における評価では、DA②の日本の代表的な使用方法／使用条件における評価に活用できないため、適合性なしと判断できる。）

*「公表文献の収集、選択等のためのガイドライン（令和 3 年 9 月 22 日農業資材審議会農薬分科会決定、令和 5 年 7 月 27 日一部改正）」に基づき、日本における適合性分類を申請者が追記した。

Appendix 1 Criteria for relevance

Appendix 1-1: List of Criteria for relevance for Product Chemistry studies

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
Physical and chemical properties (CA 2.1 to 2.15)	1. Well defined test material (including purity/content) 2. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods, and appropriate sampling regime). 3. Study conditions should not differ significantly from recommended protocols* and internationally agreed tests methods (CIPAC MT and OECD methods). 4. Study conditions should not interfere with the interpretation of the study results. 5. End-points or positions stated as a result of the study significantly affect the proposed risk assessment in the dossier.

Table Appendix 1-2: List of Criteria for relevance for toxicological and toxicokinetic studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
*CA 5.1 ADME studies	1. Well identified test material including purity and impurity profile 2. Relevant test species e.g. rodent – rat/mouse – non-rodent – dog 3. Relevant endpoint e.g. ADME measurement or metabolite identification 4. Well described condition of the test and quantitative assessment of results to substantiate and evaluate whether the study conclusions and endpoints are robust
*CA 5.2 Acute toxicity	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rats and mice, rabbit, guinea pig 3. Relevant route of administration for risk assessment 4. Describe observations, examinations, analyses performed or necropsy 5. Different outcome to those studies currently reported
*CA 5.4 Genotoxicity	1. Well identified test material including purity and impurity profile 2. Relevant cell line or species used 3. “validated” or widely used test method 4. In vitro observation not addressed by in vivo data (including tissue specific effects) 5. In vivo effect in somatic or germs cells in relevant species 6. Relevant route of exposure to test substance 7. Contradicts submitted studies, impacts WoE. 8. Recognised methods for scoring studies outcomes used where applicable
*CA 5.3, 5.5, 5.6, 5.7, 5.8.1 Short term, chronic, reproductive and neurotoxicity, studies on metabolites	1. Well identified test material including purity and impurity profile 2. Test species likely to be relevant to mammalian toxicology assessment – rodents rats and mice, non- rodent dog is preferred 3. Sufficient number of animals per group to establish statistical significance 4. Test several dose levels (minimum 3) 5. Relevant route of administration for risk assessment 6. Include negative control (preferable) 7. Establish dose response 8. Describe observations, examinations, analyses performed or necropsy 9. Contradicts submitted studies and/or changes key endpoints

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
CA 5.8.2 Supplementary studies on the active substance	1. Identified test material 2. Unusual routes of exposure acceptable as they may introduce important information on other possible toxicological effects 3. Regulatory use usually limited to addressing species sensitivity /safety factors etc. 4. Examples of studies a. Effects of combined exposures b. Hormonal effects (if not guideline studies or included in 5.8.3) c. Hypersensitivity of specific sub-populations d. Gender and age variation in susceptibility (if not included in 5.6 Reproductive studies) e. Mode of action investigations
CA 5.8.3 Endocrine disrupting properties	1. Identified test material 2. All studies considered relevant at this stage – need to be checked for reliability
CA 5.9 Medical data (including epidemiology) CP 7.2 to 7.4	1. Identified test material 2. All records considered relevant at this stage - need to be checked for reliability

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1-3: List of Criteria for relevance for Metabolism and Residues

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
Metabolism and residues data (CA 6.1 to 6.9)	
Summary	The relevance criteria applied to determine whether a literature reference was relevant for the residues and metabolism sections of the active substance renewal process are given below. 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species. e.g. is the crop a representative use; were relevant animal commodities used? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. did the study meet the relevant guidelines? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. was the compound used previously at the trial site; was the animal feed free from the compound? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 6. Validated Analytical methodology employed. e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given? 7. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.1 Storage Stability of Residues (plant and animal)	Storage Stability Studies 1. Well defined test material. e.g. are purity and batch data provided? 2. Applicable test species.

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	e.g. is the crop a representative use; were relevant animal commodities used? 3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. did the study meet the relevant guidelines and GAP? 4. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. were storage intervals recorded; are weather conditions and plot histories available? 5. Validated analytical methodology employed e.g. were control samples used, acceptable recoveries obtained, clear example chromatograms given? 6. Study conditions do not interfere with the interpretation of the study results. e.g. starting processing material residue is robust and there is measurable residue in processed products?
CA 6.2 Metabolism, distribution and Expression of Residues (plant and animal) **CA 6.6.2 Metabolism and Distribution in Succeeding Crops**	1. Well defined test material. e.g. if radiolabelled material was used, was an appropriate isotope used? 2. Applicable test species. e.g. ruminant, poultry, etc.? 3. Study conditions should not differ significantly from guidelines and recommended protocols, and must be relevant to those in the submission. e.g. is the application rate relevant and equivalent to maximum seasonal rate on rotated crops? 4. Trial site/test system not previously exposed to the test material or other contaminants e.g. is plot history supplied? 5. Sufficient experimental information is provided to substantiate and evaluate whether the study conclusions and endpoints are robust. e.g. Were metabolites identified by appropriate techniques? 6. Validated analytical methodology employed. e.g. were representative clear chromatograms provided to support metabolite identification? 7. Study conditions do not interfere with the interpretation of the study results. e.g. if the test item is photolabile was the study conducted outdoors?
CA 6.3 Magnitude of Residues Trials in Plants	Published monitoring reports were not considered relevant due to the fact that it would not be possible to determine whether or not a misuse scenario had resulted in the residue levels reported. <u>Crop Studies</u> 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. 7. Study conditions should not interfere with the interpretation of the study results. <u>Notes for above criteria</u> 1. Well defined test material (including purity/content) e.g. was the formulation comparable to the proposed representative formulation? 2. Applicable test species e.g. is it a representative use crop? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Is the GAP relevant? Correct rate, application method, interval, PHI, spray volume, BBCH (if applicable), region, indoor/outdoor, control samples taken?

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	e.g. were weather details available? e.g. were the control plots well separated from treated plots? e.g. was the field phase conducted according to GLP? e.g. were samples stored deep frozen? Were appropriate numbers of samples taken, e.g. 2kg of apples? e.g. was appropriate sampling methodology employed? Was the sample handling traceable? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. Plot history supplied, e.g. evidence that compound not used that year or previous year, and information on other plant protection products (e.g. to check for common metabolites). 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above and also, have they proposed an endpoint, e.g. MRL, what statistical methods have they used for this? 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Was a validated method used, were acceptable recoveries obtained, were control samples analysed, were control samples 'clean', were representative clear chromatograms provided, Was the analytical phase conducted according to GLP? Were all components of the residue definition analysed for? Were samples analysed within a time period covered by storage stability data?
CA 6.4 Livestock Feeding Studies	Same criteria as for crop studies, examples could be as above with the following additions. <u>Livestock Feeding Studies Notes</u> 1. Well defined test material (including purity/content) 2. Applicable test species e.g. Ruminant, poultry, pig, fish, any edible animal. 3. Study conditions should not differ significantly from recommended protocols. e.g. is the dosing level extreme? e.g. was the application form appropriate, e.g. capsule? e.g. was the number of test species correct, e.g. three cows, nine hens? e.g. was the dosing period appropriate, e.g. minimum 28 days? e.g. were control animals included? e.g. were the animals healthy? e.g. were the animals acclimatized? 4. Trial site/test system not previously exposed to the test material or other contaminants. e.g. is it clear that additional animal feed did not contain treated substance? 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.
CA 6.5 Effects of Processing	<u>High Temperature Hydrolysis</u> 1. Well defined test material (including purity/content) e.g. if radiolabelled test item was used, was an appropriate isotope used (e.g. ^{14}C and <u>not</u> ^{3}H)? e.g. if radiolabelled test item was used, was the labelling position(s) appropriate to capture potential metabolites? e.g. if radiolabelled test item was used, was the specific activity adequate to meet an LOQ of 0.01 mg/kg?

Data requirements(s) (indicated by the correspondent CA data point(s))	Criteria for relevance
	N.B. If water solubility of test item is < 0.01 mg/L then no study is required and can be deemed non-relevant 2. Applicable test system e.g. Was the test undertaken in a sterilised buffer medium? 3. Study conditions should not differ significantly from guidelines and recommended protocols. e.g. Were the temperature and pH conditions applied typical of processing operations carried out on commodities relevant to the test item? e.g. were samples stored deep frozen? 4. Trial site/test system not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. Examples as in 3 above e.g. Were metabolites identified by appropriate techniques (e.g. co-chromatography with known standards using two dissimilar chromatographic systems or by techniques capable of positive structural identification e.g. MS, NMR)? 6. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc. e.g. Were relevant control experiments carried out when harsher techniques (e.g. acid/base hydrolysis) were used to identify metabolites (i.e. to ensure metabolites identified are not merely artefacts)? e.g. were representative clear chromatograms provided to support metabolite identification? e.g. where sample analysis exceeded 6 months from sample collection was storage stability of samples demonstrated? 7. Study conditions should not interfere with the interpretation of the study results. Field Studies 1. Well defined test material (including purity/content) 2. Applicable test species 3. Study conditions should not differ significantly from guidelines and recommended protocols. 4. Trial site not previously exposed to the test material or other contaminants. 5. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 6. Study conditions should not interfere with the interpretation of the study results. 7. Validated Analytical methodology employed, e.g. control samples used, acceptable recoveries obtained, clear example chromatograms etc.
CA 6.6 Residues in Rotational crops	Same criteria as for crop residue studies, examples could be subtly different, e.g. acceptable PBIs, crop types, again monitoring information should not be considered relevant.
CA 6.7 Proposed residue definition and MRLs	Residue definition would only be affected if data generated in another section, e.g. metabolism/tox. MRLs would only be affected if residues generated and this is covered under 6.3.
CA 6.8 Proposed Safety Intervals	Not required. Any animal safety reports that might affect withholding periods would be covered in the review of literature in the Toxicology Section.
CA 6.9 Risk Assessment	Not required – any adverse findings for the risk assessment will have to be due to a data point from one of the other sections, and are therefore covered in other sections of this document.
CA 6.10 Other Studies	Not required.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1-4: List of Criteria for relevance for Ecotoxicology studies

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Ecotoxicological studies (CA 8.1 to 8.9)	Laboratory Studies 6. Well defined test material (including purity/content) 7. Number of organisms per group sufficient to establish a statistical significance 8. Applicable test species 9. Test organisms are not previously exposed to the test material or other contaminants 10. Several dose levels tested, at least 3, including a negative control, to establish a dose-response, unless the study design is specifically a limit test. Control must be run concurrently with treatments and mortality to be within test validity criteria. 11. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 12. If conducted, analytical confirmation of dosing or sufficient information provided to determine concentrations were within acceptable range (e.g. 80-120%) of nominal targets. 13. Effects are related to single test item, and a quantitative relationship exists between the reported endpoint and risk assessment endpoints of growth, mortality, behaviour and/or reproduction. 14. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust. 15. Study conditions should not differ significantly from recommended protocols. 16. Study conditions should not interfere with the interpretation of the study results. Field Studies 17. Appropriate and relevant geoclimatic conditions (setting), appropriate application method and rates (exposure) and observation data (biological relevance) to derive endpoints. 18. Well defined test material (including purity/content) 19. Applicable test species 20. Exposure route is clearly defined, is environmentally relevant and, if appropriate, suitably quantified. 21. Sufficient experimental information provided to substantiate and evaluate whether the study conclusions and endpoints are robust (e.g. pre-treatment details, characterisation of physico-chemical parameters, replication, statistical methods and appropriate sampling regime). 22. Study conditions should not differ significantly from recommended protocols, if available for field study. Study conditions should not interfere with the interpretation of the study results

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Table Appendix 1-5: List of Criteria for relevance for Environmental Fate

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
Route and rate of degradation in soil – Laboratory Studies – aerobic and anaerobic, parent and metabolites CA 7.1.1 CA 7.1.1.1 CA 7.1.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 307) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols e.g. temperature and moisture 6. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 7. Sufficient number of samples taken to determine kinetics (minimum 5) 8. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 9. Analytical method well described, LOD/LOQ at appropriate level 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 11. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 12. Identification of 'new' metabolites is robust with appropriate details of method used 13. Anaerobic conditions are verified by measurement
Route and rate of degradation in soil – Field Studies CA 7.1.2.2	1. In addition to criteria under laboratory route and rate: 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate weather data available to verify relevance of study 4. Application technique relevant to proposed use (foliar, ST granule etc) 5. Sufficient sampling detail and description of sample handling prior to analysis 6. Initial and procedural recoveries are adequate to support the conclusions, e.g. 70-120%.
Soil photolysis CA 7.1.1.3	In addition to criteria under laboratory route and rate: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Mobility studies Adsorption, desorption – parent and metabolites CA 7.1.3 Column or TLC leaching CA 7.1.4.1.1, CA 7.1.4.1.2	1. Well defined test material (including purity/content) 2. Soil(s) must be agricultural and relevant for EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 106) 3. Soil collection, preparation and storage did not differ significantly from recommended protocols 4. Test soils had not previously been exposed to the test material or structural analogues. 5. Experimental conditions did not differ significantly from recommended protocols 6. Application rate is appropriate to the proposed use and can be verified from the data 7. Sufficient number of samples taken to determine isotherm (if done) 8. Stability of the test item in the system was demonstrated 9. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Analytical method well described, LOD/LOQ at appropriate level

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	12. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Lysimeter studies CA 7.1.4.2	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data available to verify relevance of study. Combined rainfall/irrigation sufficient to meet guideline requirements 3. Minimum 1 m depth soil monolith 4. Study continued for sufficient years to support the conclusions
Field leaching CA 7.1.4.3.	In addition to criteria under laboratory route and rate: 1. Field site(s) must be geoclimatically relevant for the EU 2. Adequate weather data and groundwater data (depth, direction) available to verify the validity of study 3. Installation and operation of lysimeters and/or wells and samplers follows recommended protocols 4. Study continued for sufficient years to support the conclusions
Hydrolysis CA 7.2.1	1. Well defined test material (including purity/content) 2. Experimental conditions should not differ significantly from recommended protocols 3. Application rate is within an acceptable the range (e.g. consider solubility) and can be verified from the data (time zero samples) 4. Sufficient number of samples taken to determine kinetics (minimum 5) 5. Analytical method well described, LOD/LOQ at appropriate level 6. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90%. 7. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included 8. Identification of 'new' metabolites is robust with appropriate details of method used
Aqueous photolysis CA 7.2.1.2	In addition to criteria under hydrolysis: 1. Light source was suitable with details of spectrum and intensity available 2. Dark control included and reported
Degradation in aquatic systems CA 7.2.2	1. Well defined test material (including purity/content) 2. Water(s) and sediment(s) must be from an agricultural area and relevant for the EU e.g. from temperate zone, no extreme characteristics (e.g. meets the criteria in OECD 308) 3. Water/sediment collection, preparation and storage do not differ significantly from recommended protocols 4. Experimental conditions do not differ significantly from recommended protocols e.g. temperature and aeration 5. Application rate is within the range of the proposed use and can be verified from the data (time zero samples) 6. Sufficient number of samples taken to determine kinetics (minimum 5) 7. Extraction system was appropriate e.g. avoidance of excessive or inadequate methods 8. Analytical method well described, LOD/LOQ at appropriate level 9. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included

Data requirements(s) (indicated by the correspondent CA data point (s))	Criteria for relevance
	10. Mass balance or recovery for radiolabelled and unlabelled studies respectively is adequate to support the conclusions, e.g. >90% 11. Identification of 'new' metabolites is robust with appropriate details of method used 12. Anaerobic conditions are verified by measurement
Degradation in the saturated zone CA 7.2.3	1. For laboratory studies refer to criteria under laboratory route and rate 2. Field site(s) must be geoclimatically relevant for the EU 3. Adequate site characterisation data available e.g. soils, geology, hydrology 4. Installation of samplers e.g. wells, lysimeters follows recommended protocols 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Route and rate of degradation in air CA 7.3.1	1. Experimental conditions or calculations differ significantly from recommended protocols 2. Analytical method well described, LOD/LOQ at appropriate level 3. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. for unlabelled studies are suitable blank controls included
Monitoring CA 7.5	1. Site(s) or areas must be geoclimatically relevant for the EU 2. Adequate site characterisation data available e.g. soils, geology, hydrology 3. Installation of samplers e.g. wells, lysimeters follows recommended protocols OR adequate description of wells is available (depth of well, length of screen, depth of screen opening, depth of groundwater) 4. Appropriate sampling methodology. 5. Analytical method well described, LOD/LOQ at appropriate level 6. Analytical method appears robust with suitable reproducibility and supports the conclusions made e.g. suitable blank controls included 7. For surface water: description of sampling methodology and handling of detects (peaks, interpolated time-step?), linked to rainfall intensity and volume). Discharge volumes, catchment drained area.

* Recommended protocols under each data point include but are not limited to those listed in the Commission Communications 2013/C 95/01 and 2013/C 95/02

Appendix 2 Detailed Search Parameters for each named Dossier section

Appendix 2.1 Product Chemistry

Table Appendix 2.1-1: Detailed Search Parameters for Product Chemistry studies (CA 2.1 to 2.15)

Search Strategy
Chemical Names: 1,2,4-Triazole (CAS: 288-88-0) Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (((VAPOUR OR VAPOR)(3A)PRESSURE?) OR SOLUBILITY?) L2 QUE ((PARTITION(3A)COEFF?) OR EXPLOSIV? OR OXIDI!ING?) L3 QUE (OXIDI!ED? OR FLAMMAB? OR (FLASH(3A)POINT?)) L4 QUE (VOLATIL? OR VISCOS? OR VISCOUS? OR (LOG(W)KOW)) L5 QUE (VAPORI!AT? OR VAPOURI!AT? OR VAPOR!ED? OR VAPOURI!ED?) L6 QUE ((SPECIFIC(3A)GRAVITY?) OR ((MELTING OR BOILING)(2W)POINT)) L7 QUE (EVAPORAT? OR DENSITY OR LOGP OR (LOG(W)P) OR KOC) L8 QUE ((DIFFUSION(3A)COEFF?) OR (DISSOCI?(3A)CONSTANT?)) L9 QUE (ANTIINFLAMM? OR ANTIIGNIT? OR IGNIT? OR COMBUST?) L10 QUE ((L1 OR L2 OR L3) OR (L4 OR L5 OR L6) OR (L7 OR L8 OR L9))

Table Appendix 2.1-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.	
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)	
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.	
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.	
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.	
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.	

Provider	Database	Justification	Limits applied
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily	
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.	
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)	
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.	
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly	
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.	

Provider	Database	Justification	Limits applied
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly. (Searches 1-5 only)	
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.	
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.	

* Total number of summary records retrieved after removing duplicates

Table Appendix 2.1-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.1-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.1-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.2 Toxicology

Table Appendix 2.2-1: Detailed Search Parameters for Toxicological and Toxicokinetic studies (CA 5.1 to 5.9)

Search Strategy
Chemical Names: 1,2,4-Triazole (CAS: 288-88-0) Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (MUTAG? OR CANCER? OR TERATO? OR GENETOX? OR CARCIN?) L2 QUE (TUMOUR? OR TUMOR? OR CYTOTOX? OR GENOTOX? OR MELANOM?) L3 QUE (NEUROTOXI? OR LD50 OR IC50 OR ((LD OR IC)(W)50)) L4 QUE (((LONG OR SHORT)(W)TERM?)(L)(EFFECT? OR STUD? OR TOXIC?)) L5 QUE (ENDOCRIN? OR INHALAT? OR IRRITAT? OR REPROTOX?) L6 QUE (PERCUTANEOU? OR DERMAL? OR ORAL? OR INTOXICAT? OR INGEST?) L7 QUE (((REPRODUCT? OR EMBRYO? OR FOET? OR DEVELOP?)(5A)TOXI?)) L8 QUE ((ACUTE? OR CHRONIC?)(5A)(EFFECT? OR TOXIC? OR TOXIN#)) L9 QUE (GIRL# OR CHILD OR CHILDREN OR PATIENT# OR HUMAN# OR MAN) L10 QUE (MEN OR WOM!N OR BOY# OR WORKER# OR OPERATOR# OR FARMER#) L11 QUE (APPLICATOR# OR PERSONNEL? OR WORKFORCE OR EMPLOYEE#) L12 QUE (MAMMAL? OR RODENT# OR RAT OR RATS OR MOUSE OR MICE) L13 QUE (ACCIDENT? OR POISON? OR ALLERG? OR EXPOSURE? OR EXPOSE#) L14 QUE (OCCUPAT? OR EPIDEMIOL? OR SENSITIZ? OR SENSITIS?) L15 QUE ((HEALTH OR ADVERSE)(5A)(EFFECT# OR RISK#)) L16 QUE (MEDICAL OR (FIRST(W)AID) OR (TOXIC?(3A)STUD?) OR THERAPE?) L17 QUE (TOXICOKINETIC# OR EXTRACTAB? OR (RADIO(W)LABEL?)) L18 QUE (DOG# OR (GUINEA(W)PIG#) OR RABBIT# OR SKIN? OR EYE#) L19 QUE (HAND# OR DERMAL? OR BYSTANDER# OR RESIDENT#) L20 QUE ((ROTAT? OR SUCCEDING OR FOLLOWING)(3A)CROP#) L21 QUE ((DIETARY OR CONSUM? OR CUMULAT? OR AGGREGAT?)(5A)RISK?) L22 QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21)

Search Strategy
L2 QUE SPE=ON ABB=ON PLU=ON ABNORMAL BEHAVIOUR OR ABORTION OR ACCEPTABLE DIETARY INTAKE OR ACCEPTABLE OPERATOR EXPOSURE LEVEL OR ACUTE DERMAL APPLICATION OR ACUTE DERMAL TOXICITY OR ACUTE EFFECT OR ACUTE EXPOSURE OR ACUTE ORAL TOXICITY OR ACUTE REFERENCE DOSE
L3 QUE SPE=ON ABB=ON PLU=ON ACUTE TOXICITY OR ADDITIVE TOXICITY OR ADULT MORTALITY OR ADVERSE EFFECT OR ADVERSE EVENT OR AERIAL EXPOSURE OR AIR BLAST OR AIRBLAST OR ANORMAL BEHAVIOUR OR ASSESSMENT(1W)RISK OR AVERSIVE RESPONSE OR BBA MODEL OR BEHAVIOUR
L4 QUE SPE=ON ABB=ON PLU=ON BEHAVIOURAL ANOMALIES OR BIO MONITORING OR BIOMONITORING OR BIRTH RATE OR BODY ORGANS OR BODY WEIGHT OR BREEDING LOSS OR BYSTANDER OR CARCINOGEN OR CARCINOGENIC OR CARCINOGENICITY OR CHANGE (1W) BODY WEIGHT OR CHEMOSIS OR CHRONIC CONCERN
L5 QUE SPE=ON ABB=ON PLU=ON CHRONIC EFFECT OR CHRONIC STUDY OR CHRONIC TEST OR CHRONIC TOX OR CHRONIC TOXICITY OR CHRONIC TOXICOLOGICAL STUDY OR CLASTOGENICITY OR CLINICAL SIGN OR CLINICAL SYMPTOM OR CONJUNCTIVAE OR CONJUNCTIVAL CHEMOSIS OR CONJUNCTIVAL SAC
L6 QUE SPE=ON ABB=ON PLU=ON CONSTIPATIO OR CONSUMER OR CONTACT TOXICITY OR CORNEA OR CORNEAL OPACITY OR CREATININE OR CROP INSPECTION OR CYTOPLASMIC CHANGES(1W)HEPATOCYTES OR DAMAGE TO EYES OR DEAD EMBRYO OR DEAD FETUS OR DEAD PUP OR DEATH OR DECREASE(1W)BODY LENGTH
L7 QUE SPE=ON ABB=ON PLU=ON DERMAL OR DEVELOPMENTAL TOXICITY OR DIARRHEA OR DIE OR DIED OR DIETARY EXPOSURE OR DIETARY INTAKE OR DIETARY TOXICITY OR DIPPING OR DISLODGEABLE FOLIAR RESIDUE OR DISORIENTING OR DISTURBANCE(1W)VIABILITY OR DOG OR DUST DRIFT
L8 QUE SPE=ON ABB=ON PLU=ON EFFECT(1W)(BODY WEIGHT OR FOOD CONSUMPTION OR BODY ORGAN) OR EMBRYO OR EMBRYOPATHY OR EMBRYOTOX OR ENDOCRINE(W)DISRUPT? OR ENDOCRINE MODULATION OR ENGINEERING CONTROL OR EPIDEMIOLOGICAL OR EPIDEMIOLOGY OR ERYTHEMA
L9 QUE SPE=ON ABB=ON PLU=ON ESCHAR OR EUROPOEM OR EXPOSE OR EXPOSURE OR EYE IRRITATION OR FECUNDITY OR FEEDING STUDY OR FERTILITY RATE OR FETOTOX OR FETOTOXICOLOGICAL OR FETOTOXICOLOGY OR FOETAL CROWN-RUMP LENGTH OR FOETAL DEVELOPMENT OR FOGGING OR FOLIAR DEPOSITION
L10 QUE SPE=ON ABB=ON PLU=ON FOLIAR DISLODGEABLE RESIDUE OR GAIN(1W)BODY WEIGHT OR GASTROINTESTINAL OR GENOTOX OR GENOTOXIC OR GENOTOXICITY OR GENOTOXICOLOGICAL OR GESTATION OR GROUND BOOM OR GROUNDBOOM OR GUINEA PIG OR HAIR LOSS OR HAND TO MOUTH OR HANDHELD OR HAND-HELD
L11 QUE SPE=ON ABB=ON PLU=ON HAZARD OR HEALTH RISK OR HEPATOTOXIN OR HERSHBERGER ASSAY OR HUMAN EXPOSURE OR HUMAN HEALTH OR HUMAN MONITORING OR IMMUNOTOXICITY OR IMPLANTATION LOSS OR INCREASE (1W) LIVER WEIGHT OR INDURATION (2W) SKIN OR INFERTILITY
L12 QUE SPE=ON ABB=ON PLU=ON INHALATION OR INHALATORY ABSORPTION OR INHALATORY EXPOSURE OR INHALATORY RISK OR INTOXICATION OR INTRAPERITONEAL OR INTRAVENOUS OR INTRAVENOUSLY OR IRRITANT OR IRRITATING (1W)SKIN OR IRRITATION OR IRRITATION (2W)(IRIS OR SKIN)
L13 QUE SPE=ON ABB=ON PLU=ON KNAPSACK OR LABORED BREATHING OR LACERATION (2W) SKIN OR LACTATION OR LC50 OR LD50 OR LIGHT-COLORED FECES OR LITTER SIZE OR LITTER WEIGHT OR LIVER OR LIVING PUPS OR LOCAL LYMPH NODE OR LONG-TERM EXPOSURE OR LONGTERM STUDY OR LONG-TERM STUDY
L14 QUE SPE=ON ABB=ON PLU=ON LONGTERM TOXICOLOGICAL OR LONG-TERM TOXICOLOGICAL OR LOSS (1W)(BODY WEIGHT OR HAIR) OR MALFORMATION OR MAMMAL OR MAMMALIAN OR MARGIN (1W) SAFETY OR MATERNAL TOXICITY OR MATING BEHAVIOUR OR MEDICAL DATA OR METABOLIC PATH

Search Strategy	
	OR METABOLIC PATHWAY
L15	QUE SPE=ON ABB=ON PLU=ON MONKEY OR MORTALITY OR MOUSE OR MRL EXCEEDANCE OR MRL VIOLATION OR MULTIGENERATION OR MUTAGEN OR MUTAGENIC OR MUTAGENICITY OR NECROPSY OR NEUROTOXIC OR NEUROTOXICITY OR NO OBSERVED ADVERSE EFFECT LEVEL OR NO OBSERVED EFFECT LEVEL
L16	QUE SPE=ON ABB=ON PLU=ON NOAEL SUBCHRONIC DOG OR NON DIETARY EXPOSURE OR NON-DIETARY EXPOSURE OR NO-OBSERVED ADVERSE EFFECT LEVEL OR NURSING OR OBJECT TO MOUTH OR OCCUPATIO NAL EXPOSURE OR OEDEMA OR OFFSPRING OR OPACITY OR OPERATOR OR ORAL ABSORPTION OR ORAL TOXICITY
L17	QUE SPE=ON ABB=ON PLU=ON ORALLY OR OVULATION OR PARENTERAL OR PARTURITION OR PASSIVE DOSIMETRY OR PATHOLOGICAL OR PATHOLOGY OR PATIENT OR PEELING (1W) SKIN OR PENETRATION FACTOR OR PERCUTANEOUS OR PERSONAL PROTECTIVE EQUIPMENT OR PHOTOTOXICITY OR PILOERECTION
L18	QUE SPE=ON ABB=ON PLU=ON PLACENTAL WEIGHT OR POISON OR POISONING OR POST-MORTEM EXAMINATIONS OR POSTNATAL OR POST-NATA L OR PREGNANCY OR PREGNANT OR PREMATURE BIRTH OR PRENATAL TOX OR PRENATAL TOXICOLOGY OR PRIMATE OR PROTECTIVE CLOTHING OR PROTECTIVE GARMENT
L19	QUE SPE=ON ABB=ON PLU=ON PROTECTIVE GLOVE OR PUBLIC HEALTH OR RABBIT OR RAT OR RE ENTRY OR REDDENING (1W) TREATMENT AREA OR REDNESS OR REDUCED BODY WEIGHT OR REDUCED BODY WEIGHT GAIN OR REENTRY OR RE-ENTRY OR REFERENCE DOSE OR RELEVANT (2W) REPRODUCTIVE SUCCESS
L20	QUE SPE=ON ABB=ON PLU=ON REPRODUCTION OR REPRODUCTIVE OR REPROTOX OR RESIDENT OR RESIDENTIAL EXPOSURE OR RESIDUE IN OR RESPIRATORY EXPOSURE OR RESPIRATORY PROTECTIVE EQUIPMENT OR RISK ASSESSMENT OR RISK (2W) (CONSUMER OR OPERATOR) OR SEXUAL
L21	QUE SPE=ON ABB=ON PLU=ON RISK (1W) SERIOUS DAMAGE (1W) EYES OR SAFE OR SAFETY OR SAFETY ASSESSMENT OR SAFETY PRECAUTION OR SECONDARY EFFECT OR SECONDARY POISONING OR SEEDTROPEX OR SENSITISATION BY SKIN CONTACT OR SENSITISER OR SENSITISING TESTS OR SENSITIZER
L22	QUE SPE=ON ABB=ON PLU=ON SHORT LONG TERM EXPOSURE OR SHORT-TERM EXPOSURE OR SHORT-TERM TOXICITY OR SHORT-TERM TOXICOLOGICAL OR SIDE EFFECT OR SIGNS (1W)(AGGRESSION OR TOXICITY) OR SKIN IRRITANT OR SKIN IRRITATION OR SKIN SENSITISA TION OR SKIN SENSITISING
L23	QUE SPE=ON ABB=ON PLU=ON SKIN SENSITIZATION OR SKIN SENSITIZING OR SLIGHTLY HARMFUL OR SPASTIC GAIT OR SPERMATOGENE SIS OR SPLEEN OR SPRAY DRIFT OR STOMACH LESIONS OR STUNTED FETUS OR SUBACUTE OR SUB-ACUTE OR SUBCHRONIC OR SUB-CHRONIC OR SUBLETHAL OR SUB-LETHAL
L24	QUE SPE=ON ABB=ON PLU=ON SUBSTANCE-RELATED EFFECT OR SURVIVAL OR SYMPTOMS (1W) TOXICITY OR SYSTEMIC EXPOSURE OR SYSTEMIC INTOLERANCE REACTIONS OR TERATOGEN OR TERATOGENIC OR TERATOGENICITY OR TERATOLOGY OR TESTICULAR DEVELOPMENT
L25	QUE SPE=ON ABB=ON PLU=ON ACTIVE INGREDIENTS (1W) SAFE OR (COMPOUND OR COMPOSITION OR FUNGICIDE OR INSECTICIDE OR PESTICIDE) (1W)SAFE OR THEORETICAL TOXICITY OR TOPICAL OR TOTAL DIET STUDY OR TOX OR TOXIC OR TOXICITY OR TOXICOGENOMIC OR TOXICOKINETICS OR TOXICOL
L26	QUE SPE=ON ABB=ON PLU=ON TOXICOLOGICAL OR TOXICOLOGY OR TRACTOR MOUNTED OR TRANSDERMAL OR TRANSFER COEFFICIENT OR TRANSFERABLE RESIDUES OR TREATMENT RELATED EFFECTS OR TUMORIGEN OR TUNNEL TEST OR TWO-GENERATION OR UNACCEPTABLE EFFECTS OR UTEROTROPHIC ASSAY
L27	QUE SPE=ON ABB=ON PLU=ON VERTEBRATE OR VIABILITY (1W) EMBRYO OR WEANING OR WEIGHT ALTERATION OR WEIGHTS OR WHOLE BODY DOSIMETER OR WHOLE BODY DOSIMETRY OR WORKER

Table Appendix 2.2-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.	
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)	
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.	
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.	
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.	
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.	

Provider	Database	Justification	Limits applied
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily	
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.	
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)	
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.	
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly	
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.	

Provider	Database	Justification	Limits applied
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (Searches 1-5 only).	
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.	
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.	

* Total number of summary records retrieved after removing duplicates

Table Appendix 2.2-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.2-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.2-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.3 Metabolism and Residues

Table Appendix 2.3-1: Detailed Search Parameters for Metabolism and Residues data – Search Terms

Search Strategy
Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole PLUS L1 QUE (METABOL? OR RESIDUE# OR TRANSFORM? OR BIOTRANSFORM?) L2 QUE (DEGRAD? OR BIODEGRAD? OR FATE# OR MRL OR MRLS) L3 QUE (CONJUGAT? OR EXCRET? OR ELIMINAT?) L4 QUE (FOOD# OR FEED# OR DIET# OR DIETARY OR CONSUMER? OR HUMAN#) L5 QUE (CONTAMINAT? OR SAFE? OR EXPOS? OR ANALY? OR ASSES?) L6 QUE (INTAKE? OR (IN(W)TAKE?) OR SURVEY? OR RISK?) L7 QUE (TOXIC? OR STUDY? OR STUDIES?) L8 QUE (L4(10A)(L5 OR L6 OR L7)) L9 QUE (LIVESTOCK# OR COW# OR GOAT# OR CATTLE# OR BULLOCK#) L10 QUE (BOVINE? OR BOVIDAE? OR BOS OR BULL# OR HEIFER? OR CAPRA#) L11 QUE (SHEEP# OR EWE OR EWES OR RAM# OR SWINE# OR PIGLET#) L12 QUE (PIG# OR SUIDAE? OR SUS OR OVIS OR OX OR OXEN) L13 QUE (RUMINANT? OR HEN# OR CHICKEN# OR FOWL# OR TURKEY?) L14 QUE (DUCK# OR GOOSE OR GEESE OR CAPON# OR POULTRY?) L15 QUE (MEAT OR MILK OR EGG# OR TISSUE#) L16 QUE (((BROKEN? OR BREAK?)(W)(DOWN OR UP)) OR BREAKDOWN?) L17 QUE (BREAKSDOWN? OR UPTAKE? OR PROCESSING? OR BOUND?) L18 QUE ((NON(W)EXTRACTAB?) OR (ROTATIONAL(3A)CROP#)) L19 QUE ((L1 OR L2 OR L3) OR L8 OR (L9 OR L10 OR L11 OR L12 OR L13 OR L14) OR (L15 OR L16 OR L17 OR L18))

Table Appendix 2.3-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number *
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	10 years	368
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		

Provider	Database	Justification	Limits applied	Number *
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly. (Searches 1-5 only)		
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		

* Total number of summary records retrieved after removing duplicates – numbers in parentheses are the summary records retrieved in the initial search and then
the 1st and 2nd top-up respectively)

Table Appendix 2.3-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.3-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.3-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.4 Ecotoxicology

Table Appendix 2.4-1: Detailed Search Parameters for Ecotoxicological studies (CA 8.1 to 8.9)

Search Strategy		
L1	**QUE**	**(288-88-0 OR 1450828-63-3 OR 28711-29-7 OR 333354-47-5)**
L2	**QUE**	**(86362-20-1 OR 114419-45-3 OR 4819-36-7)**
L3	**QUE**	**(1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID)**
L4	**QUE**	**(1(W)2(W)4(W)TRIAZOLE(W)1(W)ACETIC(W)ACID)**
L5	**QUE**	**(1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YLACETIC(W)ACID)**
L6	**QUE**	**(2(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)**
L7	**QUE**	**(2(2W)1H(2W)1(W)2(W)4(W)TRIAZOL(W)1(W)YL(W)ACETIC(W)ACID)**
L8	**QUE**	**((1H(2W)1(W)2(W)4(W)TRIAZOLE) OR (S(W)TRIAZOLE))**
L9	**QUE**	**((3(W)4(W)DIAZAPYRROLE) OR (4H(2W)1(W)2(W)4(W)TRIAZOLE))**
L10	**QUE**	**(25167-73-1 OR 27236-77-7 OR 116421-29-5 OR 1001118-18-8)**
L11	**QUE**	**(3(2W)1H(W)1(W)2(W)4(W)TRIAZOL#(W)1(W)YL(W)ALANINE)**
L12	**QUE**	**(1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPANOIC(W)ACID)**
L13	**QUE**	**(1H(2W)1(W)2(W)4(W)TRIAZOL#(W)1(W)PROPIONIC(W)ACID)**
L14	**QUE**	**((2(W)HYDROXY(W)3)(2W)(L12 OR L13))**
L15	**QUE**	**((ALPHA(W)(HYDROXY OR AMINO))(3A)(L12 OR L13))**
L16	**QUE**	**(L1-11 OR L14-15)**
		PLUS
L1	QUE	(RIPARIAN? OR REPTILE? OR SNAKE? OR LIZARD?)
L2	QUE	(TORTOISE? OR TURTLE? OR TERRAPIN? OR CROCODIL?)
L3	QUE	(ALLIGATOR? OR CAIMAN? OR GHARIAL? OR HOVERFLIES)
L4	QUE	((MEADOW#(W)VOLE#) OR PSEUDOKIRSCHNERIELLA)
L5	QUE	(RHAPHIDOCELIS OR NITZSCHIA OR CYCLOTELLA OR MICROCYSTIS)
L6	QUE	(OSCILLATORIA OR APHANIZOMENON OR ANKISTRODESMUS)
L7	QUE	(TEILINGRIA OR MONORAPHIDIUM OR RADIOCOCCACAE OR

Search Strategy
TETRASPORALES)
L8 QUE (TETRAEDRON OR TREUBARIA OR WILLEA OR COSMOCLADIUM)
L9 QUE (HYPOASPIS OR (SOIL(3A)MICROORGAN?) OR ECHINOCHLOA OR SPARTINA)
L10 QUE (SALVINIA OR NAJAS OR CALLITRICHE OR MYOSOTIS OR STRATIOTES)
L11 QUE (HIPPURUS OR PERSICARIA OR CLOEON? OR CORBICULA?)
L12 QUE (NEOCARIDINIA? OR NEOCARIDINA? OR MYSID? OR CICHLIDAE)
L13 QUE (CICHLID# OR LEPOMIS? OR SERRANIDAE OR PERCIFORMES)
L14 QUE (ICTALURUS? OR POECILIA? OR ORYZIAS? OR GASTEROSTEUS?)
L15 QUE (GASTEROSTEIDAE OR SALVELINUS OR BRACHYDANIO? OR CARASSIUS?)
L16 QUE (MISGUMUS? OR CYPRINODON? OR FUNDULUS? OR MISGURNUS?)
L17 QUE (BREAM OR ROTIFER# OR GAMMARUS OR GAMMARID? OR MAYFLY?)
L18 QUE (BIVALVE# OR MUSSEL# OR MOLLUSK# OR MOLLUSC# OR BUFO)
L19 QUE (NEWT# OR SCALLOP# OR CLAM# OR GAMBUSIA OR OREOCHROMIS)
L20 QUE (OSTRAC? OR TUBIFEX? OR TURBELLARIA OR COPEPODA)
L21 QUE (PREDACE? OR PREDACI? OR PARASITOID? OR APIS OR APIDAE)
L22 QUE (BOMBUS OR BOMBINAE OR WORM# OR LUMBRICIDAE OR LUMBRICUS)
L23 QUE (ALLOBOPHORA? OR DENDROBAENA? OR APORRECTODEA? OR DENDRODRILUS?)
L24 QUE (EISENIA? OR OCTOLASION? OR (LACE(W)WING#) OR NEUROPTER?)
L25 QUE (CARABID? OR CARBUS OR STAPHYLINID? OR COCCINEL? OR ADALIA?)
L26 QUE (STETHORUS? OR SCYMNUS? OR WASP# OR VESPIDAE OR SPHECOIDEA)
L27 QUE (SPHECIDAE OR STIZIDAE OR OPIUS OR (ICHNEUMON(W)FL?))
L28 QUE (ICHNEUMONID? OR BRACONID? OR CHALCID? OR CYNIP? OR APHIDI?)
L29 QUE (EUCOILID? OR IBALIID? OR FIGITID? OR EURYTOM? OR TORYM?)
L30 QUE (ORYM? OR EUCHARIT? OR PERILAMP? OR PTEROMAL? OR CHRYSOLAMP?)
L31 QUE (EUPELM? OR ENCYRT? OR SIGNIPHOR? OR APHELIN? OR ELASMID?)
L32 QUE (ELASMUS OR TETRACAMP? OR MYMAR? OR HELOR? OR PROCTOTRUP?)
L33 QUE (DIAPRI? OR SCELION? OR PLATYGASTR? OR PLATYGASTER?)
L34 QUE (CERAPHRON? OR MEGASPIL? OR ARANE? OR OPILION? OR PHALANG?)
L35 QUE (ARACHNID? OR HARVESTM? OR DADDYLONGLEG? OR (DADDY(W)LONG(W)LEG?))
L36 QUE ((DADDY(W)LONGLEG?) OR COLLEMB? OR (SPRING(W)TAIL?) OR CYDNODROMUS?)
L37 QUE (PARDOSA? OR ORIUS? OR TYPHLODROM? OR PHYTOSEIULUS? OR SYRPHID?)
L38 QUE (METASYRPHUS? OR SYRPHUS? OR EUPEODES? OR EPISYRPHUS? OR SYRPHIAN?)
L39 QUE (EPISTROPHE? OR AMBLYSEIUS? OR POECILUS? OR TRECHUS? OR BEMBIDION?)
L40 QUE (NEBRIA? OR PTEROSTICHUS? OR CALOSOMA? OR TACHYPORUS? OR NABIDAE?)
L41 QUE (GEOCORIS? OR HYMENOPT? OR HAEMATOLOECHA? OR CHRYSOPID? OR SYMPHYTA?)
L42 QUE (OULEMA? OR APHYTIS? OR BATHYPLECTES? OR LINPHIIDAE? OR LYNPHIIDAE?)

Search Strategy

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L43             QUE  (LINYPHIIDAE? OR ERIGONE? OR BATHYPHANTES? OR MEIONETA?
OR
                     OEDOTHORAX?)
L44             QUE  (LEPTHYPHANTES? OR LYCOSID? OR LYCOSA? OR CHRYSOPA? OR
DACNUSA?)
L45             QUE  (CYRTORHINUS? OR CRYPTOLAEMUS? OR ZETZELLIA? OR
LEPTOMASTIX?)
L46             QUE  (TRICHOGRAMMA? OR ENCARSIA? OR MACROLOPHUS? OR
CHRYSOPERLA?)
L47             QUE  (ALEOCHARA? OR CHRYSOPID# OR CHRYSOPIDAE OR DIABROTICA)
L48             QUE  (PALEXORISTA? OR MAMMAL## OR ANIMAL? OR RABBIT? OR
RODENT#)

BIRD PROFILE    [L94]

L49             QUE  (BLACKBIRD# OR (BLACK(W)BIRD#) OR ((TURDUS OR
T)(W)MERULA))
L50             QUE  (CHAFFINCH? OR ((FRINGILLA OR F)(W)COELEBS) OR
GREENFINCH?)
L51             QUE  (((CARDUELIS OR C)(W)CHLORIS) OR SONGTHRUSH?)
L52             QUE  ((SONG(W)THRUSH?) OR ((TURDUS OR T)(W)PHILOMELOS) OR
WREN#)
L53             QUE  (((TROGLODYTES OR T)(W)TROGLODYTES) OR
(WILLOW(W)WARBLER#))
L54             QUE  (((PHYLLOSCOPUS OR P)(W)TROCHILUS) OR (GREAT(W)TIT#))
L55             QUE  (((PARUS OR P)(W)MAJOR) OR ROBIN# OR GOLDFINCH?)
L56             QUE  (((ERITHACUS OR E)(W)RUBECULA) OR DUNNOCK#)
L57             QUE  (((CARDUELIS OR C)(W)CARDUELIS) OR LINNET#)
L58             QUE  (((PRUNELLA OR P)(W)MODULARIS) OR SKYLARK# OR
(SKY(W)LARK#))
L59             QUE  ((HEDGE(W)(SPARROW# OR ACCENTOR#)))
L60             QUE  (((CARDUELIS OR C)(W)CANNABINA) OR ((ALAUDA OR
A)(W)ARVENSIS))
L61             QUE  ((RED(W)LEGGED(W)PARTRIDGE#) OR ((ALECTORIS OR
A)(W)RUFA))
L62             QUE  ((MEADOW(W)PIPIT#) OR MEADOWPIPIT# OR ((ANTHUS OR
A)(W)PRATENSIS))
L63             QUE  (LAPWING# OR ((VANELLUS OR V)(W)VANELLUS) OR PEEWIT#)
L64             QUE  (STARLING# OR ((STURNUS OR S)(W)VULGARIS))
L65             QUE  ((TURTLE(W)DOVE#) OR ((STREPTOPELIA OR S)(W)TURTUR))
L66             QUE  (YELLOWHAMMER# OR (YELLOW(W)HAMMER#) OR
(YELLOW(W)WAGTAIL#))
L67             QUE  (((EMBERIZA OR E)(W)CITRINELLA) OR
(YELLOW(W)WAG(W)TAIL#))
L68             QUE  (((MOTACILLA OR M)(W)FLAVA) OR
(FAN(W)TAILED(W)WARBLER#))
L69             QUE  ((GREY(W)LAG(W)G!!SE) OR ((ANSER OR A)(W)ANSER))
L70             QUE  (REEDBUNTING# OR (REED(W)BUNTING#) OR ((EMBERIZA OR E)
                     (W)SCHOENICLUS))
L71             QUE  (CHAFFINCH? OR BLUETIT? OR (BLUE(W)TIT?))
L72             QUE  (((PARUS OR P)(W)CAERULEUS) OR (SYLVIA(W)COMMUNIS))
L73             QUE  (((GALERIDA OR G)(W)CRISTATA) OR (TREE(W)SPARROW#))
L74             QUE  (((COTURNIX OR C)(W)COTURNIX) OR (GREY(W)PARTRIDGE#))
L75             QUE  (((PERDIX OR P)(W)PERDIX) OR ((PHASIANUS OR
P)(W)COLCHICUS))
L76             QUE  (((MILIARIA OR M)(W)CALANDRA?) OR GREYLAGG!!SE)
L77             QUE  ((GREYLAG(W)G!!SE) OR ((COLUMBA OR C)(W)PALUMBUS?))
L78             QUE  (((STREPTOPELIA OR S)(W)(ORIENTALIS? OR RISORIA?)))
L79             QUE  (((MOTACILLA OR M)(W)ALBA?) OR (CRESTED(W)LARK#))
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Search Strategy

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L80             QUE  ((WHITE(W)WAGTAIL#) OR (WOOD(W)PIGEON#) OR
(BIRD(W)LIFE))
L81             QUE  ((SONG(W)BIRD#) OR VANELLUS? OR (PEE(W)WIT#))
L82             QUE  (AVIFAUNA? OR (AVI(W)FAUNA?) OR SONGBIRD?)
L83             QUE  (ORNITHOLOG? OR PASSERINE? OR WOODPIGEON#)
L84             QUE  (((PASSER OR P)(W)MONTANUS) OR QUAIL# OR
(CALANDRA(W)LARK#))
L85             QUE  (CISTICOLA? OR (Z(W)CISTICOLA?) OR BIRDLIFE)
L86             QUE  (GEESE OR GOOSE OR SPARROWS OR PIGEONS OR LARK#)
L87             QUE  (WARBLER# OR PARTRIDGE# OR BUNTING# OR WAGTAIL#)
L88             QUE  (WHITETHROAT# OR PIED# OR (WHITE(W)THROAT#))
L89             QUE  ((FORAGING OR FARMLAND OR GRASSLAND)(3A)BIRD#)
L90             QUE  (BLUEBIRD# OR (ROCK(W)PTARMIGAN#) OR
(BLACK(W)REDSTART#))
L91             QUE  ((PREDATOR? OR NONTARGET? OR (NON(W)TARGET))(3A)BIRD#)
L92             QUE  ((CORN(W)BUNTING#) OR SERINS OR SERINUS)
L93             QUE  (L49-L92)
L94             QUE  L93 NOT (JAPANESE? OR JAPONICA?)

MAMMALS PROFILE  [L105]

L95             QUE  (((SMALL OR WILD)(3A)MAMMAL#) OR (WILD(3A)ANIMAL?))
L96             QUE  (VOLE# OR GLIS OR DORMOUSE OR DORMICE OR ELIOMY#)
L97             QUE  (LEROT# OR LAGOMORPH# OR LEPORID? OR LEPUS OR
ORYCTOLAGUS?)
L98             QUE  (HARE# OR SORICIDAE? OR SOREX? OR NEOMY# OR CROCIDURA?)
L99             QUE  (SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS? OR
MICROTUS?)
L100            QUE  (CLETHRIONOMYS? OR CRICETIDAE? OR MICROTIN?)
L101            QUE  (RAPTOR# OR MARMOSET# OR GOPHER# OR GRASSCUTTER#)
L102            QUE  ((PREDATOR? OR NONTARGET? OR
(NON(W)TARGET?))(3A)MAMMAL#)
L103            QUE  ((WOOD(W)(MOUSE OR MICE)) OR ARVICOLA?)
L104            QUE  (MEADOW#(W)VOLE#)
L105            QUE  (L95-L104)

EXISTING ECOTOX PROFILE [L171]

L106            QUE  (ECOTOX? OR LC50 OR ((LC OR EC OR LR)(W)50) OR EC50 OR
LR50)
L107            QUE  (ECO OR ECOL OR ECOLOG? OR ENV OR ENVIRONM? OR
AQUATIC?)
L108            QUE  (L107(5A)(TOX? OR RISK? OR IMPACT? OR EFFECT?))
L109            QUE  (AQUATIC? OR FRESHWATER? OR (FRESH(W)WATER?))
L110            QUE  (FLORA OR FAUNA  OR BIOTA OR ORGANISM? OR INSECT?)
L111            QUE  (ENVIRONM? OR LIFE OR INVERTEB? OR CRUSTACE? OR
SPECIES)
L112            QUE  (ENTOMOFAUNA OR (ENTOMO(W)FAUNA))
L113            QUE  (L109(5A)(L110 OR L111 OR L112))
L114            QUE  (MAGNA? OR (D(W)MAGNA?) OR CHIRONOM? OR BRACHIONUS?)
L115            QUE  (LIMNEA? OR CRASSOSTREA? OR ALGA# OR FISH OR FISHES)
L116            QUE  (ONCORHYNCHUS? OR SALMONIDAE? OR CYPRINUS? OR
CYPRINID?)
L117            QUE  (PIMEPHALES? OR PISCES OR TROUT OR SUNFISH? OR CARP)
L118            QUE  (MINNOW? OR (F(W)MINNOW?) OR CATFISH? OR ZEBRAFISH?)
L119            QUE  (GOLDFISH? OR (ZEBRA(W)DANIO#) OR GUPPY OR GUPPIES)
L120            QUE  (KILLFISH? OR FATHEAD? OR BLUEGILL? OR SALMON#)
L121            QUE  (THUNDERFISH? OR (WATER(W)(FLY OR FLEA?)) OR
WATERFLEA?)
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Search Strategy		
L122	QUE	(FROG# OR AMPHIBIA? OR SHRIMP# OR PRAWN# OR CRAB# OR TOAD#)
L123	QUE	(TADPOLE# OR CRAYFISH? OR SHELLFISH? OR LOBSTER#)
L124	QUE	(OYSTER# OR SNAIL# OR RANA OR RANIDAE? OR PLANKTON?)
L125	QUE	L106 OR L108
L126	QUE	((NONTARGET? OR (NON(W)TARGET?))(5A)(PLANT? OR FLORA?))
L127	QUE	((AQUATIC(3A)(PLANT? OR (PHYTO(W)TOX?) OR PHYTOTOX?)))
L128	QUE	(SEDIMENT? OR HYDROSOIL? OR DUCKWEED? OR PONDWEED?)
L129	QUE	(((DUCK OR POND)(W)WEED#) OR MACROPHYT? OR PERIPHYTON?)
L130	QUE	(POTAMOGETON? OR CHAROPHYTA? OR ELODEA? OR HYDROCHARITA?)
L131	QUE	(CERATOPHYL? OR CHLAMYDOMON? OR SELENASTRUM? OR CHLORELLA?)
L132	QUE	(SCENEDESMUS? OR SKELETONEMA? OR NAVICULA? OR ANABAENA?)
L133	QUE	(MYRIOPHYLLUM? OR GLYCERIA?)
L134	QUE	(NONTARGET? OR (NON(W)TARGET?) OR BENEFICIAL?)
L135	QUE	(EFFECT? OR INVERTEB? OR ORGANISM? OR ARTHROPOD? OR INSECT?)
L136	QUE	(FAUNA OR SPECIES OR (ENTOMO(W)FAUNA?) OR ENTOMOFAUNA?)
L137	QUE	((L134(5A)(L135 OR L136)))
L138	QUE	(PREDAT? OR (NATURAL(W)ENEM?) OR BEE OR BEES OR HONEYBEE#)
L139	QUE	(BUMBLEBEE# OR ((HONEY OR BUMBLE)(W)BEE#) OR EARTHWORM?)
L140	QUE	((EARTH(W)WORM?) OR LADYBUG# OR LADYBEETLE# OR LADYBIRD#)
L141	QUE	((LADY(W)(BUG# OR BEETLE# OR BIRD#)) OR HOVERFLY)
L142	QUE	(HOOVERFLIES OR SAWFLY OR SAWFLIES OR DRONEFLY)
L143	QUE	(DRONEFLIES OR FLOWERFLY OR FLOWERFLIES OR LACEWING?)
L144	QUE	(((HOVER OR DRONE OR FLOWER OR SAW)(W)(FLY OR FLIES)))
L145	QUE	(SPIDER# OR SPRINGTAIL? OR (ROOT(W)WORM#) OR ROOTWORM#)
L146	QUE	(L137-L145)
L147	QUE	(BIRD? OR AVES OR AVIAN? OR (AVI(W)FAUNA?) OR AVIFAUNA?)
L148	QUE	(SONGBIRD? OR (SONG(W)BIRD?) OR ORNITHOLOG?)
L149	QUE	(L147 OR L148)
L150	QUE	((WILD(3A)(LIFE OR ANIMAL#)) OR WILDLIFE OR SQUIRREL?)
L151	QUE	(VOLE# OR SCIURUS OR GLIRID? OR GLIS OR DORMOUSE)
L152	QUE	(DORMICE OR ELIOMYS OR LEROT# OR MUSTELID? OR MINK#)
L153	QUE	(MUSTELINE# OR WEASEL? OR STOAT? OR MUSTEL? OR BADGER?)
L154	QUE	(MELES OR MELINAE OR OTTER# OR LUTRA OR LUTRINAE)
L155	QUE	(LAGOMORPH# OR LEPORID? OR LEPUS OR ORYCTOLAGUS OR HARE#)
L156	QUE	(TALPA OR MOLE OR MOLES OR HEDGEHOG? OR (HEDGE(W)HOG?))
L157	QUE	(CROCIDURA? OR SHREW# OR WOODMOUSE OR WOODMICE OR APODEMUS)
L158	QUE	(MICROTUS OR ARVICOLA OR CLETHRIONOMYS? OR CRICETIDAE?)
L159	QUE	(ERINACEUS OR ERINACEIDAE? OR SORICIDAE? OR SOREX)
L160	QUE	(ENDOCRIN? OR HORMON?)
L161	QUE	(DISRUPT? OR MIMIC? OR MODULAT? OR DISORDER? OR DISEASE?)
L162	QUE	(L160(5A)L161)
L163	QUE	(DAPHNI? OR CERIODAPHNI? OR HYALELLA? OR ASSELLUS)
L164	QUE	(L113-L124) OR L163
L165	QUE	(PHYTOPLANKTON? OR AUFWUCH# OR LEMNA? OR ARALES OR CHARA)
L166	QUE	(L126-L129) OR (L130-L133) OR L165
L167	QUE	(NEOMYS OR MICROTINAE?)

Search Strategy		
L168	QUE	(L150-L159) OR L167
L169	QUE	(LOACH? OR STICKLEBACK? OR MUMMICHOG# OR TILAPIA? OR ASELLUS)
L170	QUE	L164 OR L169
L171	QUE	L125 OR L170 OR L166 OR L146 OR L149 OR L168 OR L162
L172	**QUE**	**(L1-L48)**
L173	**QUE**	**(L171 OR L172 OR L94 OR L105) TOTAL PROFILE**

Table Appendix 2.4-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	46
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		1
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		0
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		0
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		0
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		2

Provider	Database	Justification	Limits applied	Number*
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		1
	HCAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		42
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		0
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		1
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		35
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		0

Provider	Database	Justification	Limits applied	Number*
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (searches 1-5 only).		0
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		1
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		0

* Total number of summary records retrieved after removing duplicates, number in parenthesis is number in Search 4

Table Appendix 2.4-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.4-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates

Appendix 2.5 Environmental Fate

Table Appendix 2.5-1: Detailed Search Parameters for Fate and behaviour in the environment (CA 7.1.1 to 7.5)

Search Strategy
Chemical Names: 1H-1,2,4-Triazole-1-propanoic acid, α-hydroxy-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (±)- 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αR) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (αS) (CA Index Name) 1H-1,2,4-Triazole-1-propanoic acid, α-amino-, (S)- 1H-1,2,4-Triazole-1-propionic acid, α-amino-, L- (8CI) 1H-1,2,4-Triazole-1-acetic acid (CA Index Name) 1,2,4-Triazol-1-ylacetic acid 1,2,4-Triazole-1-acetic acid 1H-1,2,4-Triazol-1-ylacetic acid 2-(1,2,4-Triazol-1-yl) acetic acid 2-(1H-1,2,4-Triazol-1-yl) acetic acid 1H-1,2,4-Triazole (CA Index Name) s-Triazole (8CI) 3,4-Diazapyrrole 4H-1,2,4-Triazole Trade Names and Company codes: No relevant trade names Plus L1 QUE (FATE# OR DEGRAD? OR PERSIST? OR DECOMP? OR DECAY?) L2 QUE (TRANSFORM? OR DETERIORAT? OR METAB? OR DEGENERAT?) L3 QUE (BIODEGRAD? OR BIOTRANSFORM? OR BIODETERIORAT?) L4 QUE (BIODEGENERAT? OR BREAKDOWN? OR BREAKSDOWN?) L5 QUE (((BROKEN? OR BREAK?)(W)(UP OR DOWN)) OR HALFLIFE#) L6 QUE (HALFLIVES OR HALF(W)(LIFE OR LIVES) OR DEGRDN# OR DECOMPN#) L7 QUE (BIODEGRDN# OR DEGN# OR BIODEGN# OR DISSIP? OR RESIDUE?) L8 QUE (LEACH? OR TRANSPORT? OR MOBIL? OR MOVEMENT? OR HYDROLY?) L9 QUE (ADSORP? OR ADSORB? OR SORP? OR SORB? OR DESORP?) L10 QUE (DESORB? OR RUNOFF OR (RUN#(W)OFF) OR DRAIN? OR PERCOLAT?) L11 QUE (WASHOFF? OR WASHOUT? OR (WASH?(W)(OUT OR OFF))) L12 QUE ((((OFF(W)TARGET) OR LATERAL OR HORIZONTAL)(3W)MOVE?)) L13 QUE (PHOTOLY? OR PHOTODEGRAD? OR PHOTODECOMP?) L14 QUE (PHOTOTRANSFORM? OR PHOTOSTAB? OR PHOTODEGRDN# OR PHOTODEGN#) L15 QUE ((PHOTO(W)(DECOMP? OR DEGRAD? OR TRANSFORM? OR STAB? OR CHEM?))) L16 QUE (PHOTOCHEM? OR VOLATIL? OR VAPOUR? OR VAPOR? OR DT50 OR DT90) L17 QUE ((DT(W)50) OR (DT(W)90) OR KDOC OR (K(W)DOC) OR KD OR KOC) L18 QUE ((K(W)OC) OR (PARTITION?(3W)COEFF?) OR FREUNDLICH) L19 QUE (SEDIMENT? OR SOIL OR SOILS OR PODZOL? OR CLAY? OR SAND?) L20 QUE (SILT? OR CHERNOZEM? OR PODSOL? OR LOAM? OR PEAT?) L21 QUE ((ORGANIC(2W)MATTER?) OR MONTMORIL? OR LATOSOL? OR HUMIC?) L22 QUE (HUMUS? OR SUBSOIL? OR AIR OR WATER? OR ATMOSPHER?) L23 QUE (RAIN### OR RAINWATER? OR RAINFALL? OR LEACH?) L24 QUE (GROUNDWATER? OR ENVIRONMENT? OR PRECIPITAT? OR POND#) L25 QUE (STREAM# OR RIVER# OR DELTA# OR ESTUAR? OR SEDIMENT?)

Search Strategy	
L26	QUE (AQUATIC? OR MARINE? OR TIDAL? OR BENTHIC? OR LAKE#)
L27	QUE (BENTHOS? OR LIMNO? OR FRESHWATER? OR SEAWATER?)
L28	QUE (SALTWATER? OR ((GROUND? OR FRESH OR SEA OR SALT)(W)WATER?))
L29	QUE (LACUSTRINE? OR MIRE OR MIRES OR RESERVOIR# OR CANAL#)
L30	QUE (LOCH# OR SEA OR OCEAN OR OCEANS OR LAGOON? OR SEAS)
L31	QUE (SEABED OR SEAFLOOR OR INTERTIDAL? OR SHORE? OR COAST?)
L32	QUE (BRACKISH OR LITTORAL? OR SEASHORE? OR MEIOBENTH?)
L33	QUE (MICROBENTH? OR MACROBENTH? OR HARBOUR# OR FLUVIAL?)
L34	QUE (MARSH? OR BOG OR BOGS OR SWAMP? OR FEN OR FENS OR ALLUVI?)
L35	QUE (MUDFLAT? OR (MUD(W)FLAT?) OR BAY OR BAYS OR CREEK#)
L36	QUE (HYDROSOIL# OR (HYDRO(W)SOIL#) OR MESOCOSM? OR MICROCOSM?)
L37	QUE (WETLAND? OR FENLAND? OR ((WET OR FEN)(W)LAND?))
L38	QUE (WATERWAY? OR WATERSHED? OR (WATER(W)(WAY? OR SHED?)))
L39	QUE (CATCHMENT? OR DITCH? OR DRAIN# OR DRAINAG?)
L40	QUE (((FOLIAGE OR FOLIAR OR LEAF OR LEAVES)(5A)EVAPORAT?))
L41	QUE ((SPRAY? OR DUST?)(3A)DRIFT)
L42	QUE (L1 OR L2 OR L3 OR L4 OR L5 OR L6 OR L7 OR L8 OR L9 OR L10 OR L11 OR L12 OR L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23 OR L24 OR L25 OR L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR L33 OR L34 OR L35 OR L36 OR L37 OR L38 OR L39 OR L40 OR L41)

Table Appendix 2.5-2: Details of Databases Searched and Justification for Selection

Provider	Database	Justification	Limits applied	Number*
Host STN	MEDLINE	Contains information on every area of medicine providing comprehensive coverage from 1948 to present. Sources include journals and chapters in books or symposia. The database is updated 5 times each week with an annual reload and therefore stays very current in its cover.	None	186 (1)
	EMBASE	The database, covers worldwide literature in the biomedical and pharmaceutical fields, including biological science, biochemistry, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoeconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Sources include more than 4,000 journals from approximately 70 countries, monographs, conference proceedings, dissertations, and reports. The databases covers data from 1974-present and is updated daily.		55 (0)
	EMBAL	The database provides early access to bibliographic data and the abstracts for references that will appear in EMBASE. Bibliographic information for references is available in EMBAL for the latest 8 weeks of EMBASE data. The database covers the worldwide literature on the biomedical and pharmaceutical fields. Bibliographic information, abstracts, and author keywords are searchable. Sources include over 4,000 journals. The database covers current data and is updated daily. (Searches 1-5 only)		0 (0)
	ESBIOBASE	A database providing comprehensive coverage of the entire spectrum of biological research worldwide. Coverage includes the following areas: applied microbiology, biotechnology, cancer research, cell & developmental biology, clinical chemistry, ecological & environmental sciences, endocrinology, genetics, immunology, infectious diseases, metabolism, molecular biology, neuroscience, plant and crop science, protein biochemistry, and toxicology. Records are selected from over 1,700 international scientific journals, books, and conference proceedings. The database covers the period 1994 - present and is updated weekly.		0 (0)
	AGRICOLA	A bibliographic database containing selected worldwide literature of agriculture and related fields. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history. The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. It covers the period 1970-present and is updated monthly.		1 (0)
	BIOSIS	A large and comprehensive worldwide life science database covers original research reports, reviews, and selected U.S. patents in biological and biomedical areas, with subject coverage ranging from aerospace biology to zoology. Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion. It covers the period 1926 – present and is updated weekly.		19 (0)
	CABA	Covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources include journals, books, reports, published theses, conference proceedings, and patents. It covers the period 1973-present and is updated weekly.		16 (3)

Provider	Database	Justification	Limits applied	Number*
	CAPLUS	Covers worldwide literature from all areas of chemistry, biochemistry, chemical engineering, and related sciences including applied, macromolecular, organic, physical, inorganic, and analytical chemistry. Current sources include over 8,000 journals, patents, technical reports, books, conference proceedings, dissertations, product reviews, bibliographic items, book reviews, and meeting abstracts. Electronic-only journals and Web preprints are also covered. Cited references are included for journals, conference proceedings and basic patents from the U.S., EPO, WIPO, and German patent offices added to the CAS databases from 1999 to the present. Also provides early access to the bibliographic information, abstracts and CAS Registry Numbers for documents in the process of being indexed by CAS. Covers the period 1907 – present and is updated daily		734 (11)
	FSTA	The database provides worldwide coverage of all scientific and technological aspects of the processing and manufacture of human food products including basic food sciences, biotechnology, hygiene and toxicology, engineering, packaging, and all individual foods and food products. Sources include more than 2,200 journals, books, reviews, conference proceedings, patents, standards, and legislation. It covers the period 1969 – present and is updated weekly.		0 (0)
	FROSTI	The database contains citations to the worldwide literature on food science and technology including food and beverages, analytical methods, quality control, manufacturing, microbiology, food processing, health and nutrition, recipes, and additives. Sources include approximately 800 scientific and technical journals, bulletins, technical reports, conference proceedings, grey literature, and British, European (EP), U.S., Japanese, and international (PCT) patent applications. Covers the period 1972 – present and is updated twice weekly. (Searches 1-5 only)		0 (0)
	GEOREF	Covers international literature on geology and geosciences. Sources include the Bibliography of North American Geology, Bibliography and Index of Geology Exclusive of North America, Geophysical Abstracts, Bibliography of Fossil Vertebrates, selected records from Geoline and from geology sections of PASCAL and state and national geological surveys. Covers the period 1669 – present and is updated twice a month.		0 (0)
	TOXCENTER	Covers the pharmacological, biochemical, physiological, and toxicological effects of drugs and other chemicals. It is composed of the following subfiles: BIOSIS, CAplus, IPA and MEDLINE and sources include abstracts, books and book chapters, bulletins, conference proceedings, journal articles, letters, meetings, monographs, notes, papers, patents, presentations, research and project summaries, reviews, technical reports, theses, translations, unpublished material, web reprints. Covers the period 1907 – present and is updated weekly		0 (1)
	PQSCITECH	Is a huge resource in all areas of science and technology from engineering to lifescience. The file is a merge of 25 STN databases formerly known as CSA databases (Cambridge Scientific Abstracts): AEROSPACE, ALUMINIUM, ANTE, AQUALINE, AQUASCI, BIOENG, CERAB, CIVILENG, COMPUAB, CONFSCI, COPPERLIT, CORROSION, ELCOM, EMA, ENVIROENG, HEALSAFE, LIFESCI, LISA, MATBUS, MECHENG, METADEX, OCEAN, POLLUAB, SOLIDSTATE, and WATER. Sources are journals, patents, books, reports, and conference proceedings spanning the period 1962 – present and it is updated monthly.		2 (2)

Provider	Database	Justification	Limits applied	Number*
	PASCAL	The database provides access to the world's scientific and technical literature including physics and chemistry, life sciences (biology, medicine, and psychology), applied sciences and technology, earth sciences, and information sciences. French and European literature is particularly well represented. Approximately 5,000 journal titles are indexed. References to theses and to conference proceedings are also included. Spans the period 1977 to present and is updated weekly (searches 1-5 only).		9 (0)
	SCISEARCH	Is an international index to the literature covering virtually every subject area within the broad fields of science, technology, and biomedicine. SciSearch contains all the records published in Science Citation Index Expanded™ and additional records from the Current Contents series of publications. Bibliographic information and cited references from over 5,600 scientific, technical, and medical journals are contained in the database. Spans the period 1974 to present and is updated weekly.		63 (3)
	ANABST	Covers worldwide literature on analytical chemistry. The ANABSTR file contains bibliographic records with abstracts (since 1984) for documents reported in printed Analytical Abstracts. Sources for ANABSTR include journals, books, conference proceedings, reports, and standards. Spans the period 1980 to present and is updated weekly.		2 (1)

* Total number of summary records retrieved after removing duplicates in Search 1, number in parenthesis is number in Search 4

Table Appendix 2.5-3: Detailed Search Parameters for Web searches

Website name and service publisher	URL	Justification	Search terms	Limits applied	Number*
A web search has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.5-4: Detailed Search Parameters for Journal Table of Contents

Journal name	Journal URL or publisher	Dates, volumes and issues searched	Method of searching	Search terms	Number*
A search for journal table of contents has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.					

* Total number of summary records or full-text documents retrieved after removing duplicates

Table Appendix 2.5-5: Detailed Search Parameters for Reference Lists

Bibliographic details of documents whose reference lists were scanned	Number*
A search for reference lists has not been conducted as the database search reported above is considered to provide an adequately comprehensive search of the quality peer reviewed literature.	

* Total number of summary records or full-text documents retrieved after removing duplicates