Literature Review Report

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

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

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

Report number

108689-CA9-1

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Reporting Date

May 19, 2020

Date of searches:

28 October 2019 (Part 0), 8 June 2018 (Part 1), 8 July 2019 & 10 July 2019 (Part 2a & 2b),
7 January 2020 (Part 3), 24 February 2020 (Part 4), 27 February 2020 (Part 5a & 5b);
04 May 2020 (Part 6)

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Disclaimer

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

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

1 Summary

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

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

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

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

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

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

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

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

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

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

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

[1] (aminomethyl)phosphonic acid (AMPA), N-acetyl-AMPA, N-acetyl-glyphosate, (hydroxymethyl)phosphonic acid (HMPA), N-methyl-AMPA, N-glyceryl-AMPA, N-malonyl-AMPA, methylphosphonic acid and N-methylglyphosate.

[2] Please note that the Literature Review Excel File will be submitted on the USB hard drive as a standalone document.

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

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

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

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

Table 1: Summary of the literature review

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

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

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

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

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

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

2 Introduction

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2.1 Bibliographic databases used in the literature review

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

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

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

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

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

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

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

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

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

2.2 Input parameters for the literature search

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

Table 6: Input parameters – active substance Glyphosate

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

Table 7: Input parameters – metabolite AMPA

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

Table 8: Input parameters – metabolite N-acetyl glyphosate

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

Table 9: Input parameters – metabolite N-acetyl AMPA

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

Table 10: Input parameters – metabolite HMPA

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

Table 11: Input parameters – metabolite N-methyl AMPA

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

Table 12: Input parameters – metabolite N-glyceryl AMPA

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

Table 13: Input parameters – metabolite N-malonyl AMPA

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

Table 14: Input parameters – metabolite methylphosphonic acid

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

Table 15: Input parameters – metabolite N-methylglyphosate

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

2.3 Endpoint specific search terms

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

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

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

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

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

Table 17: Search filters related to the technical section toxicology

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

Table 18: Search filters related to the technical section residues

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

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

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

Table 20: Search filters related to the technical section ecotoxicology

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

2.4 Relevance assessment

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

2.4.1 Relevance assessment at “title / abstract” level

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

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

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

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

2.4.2 Relevance assessment at "full-text" level

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

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

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

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

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

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

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

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

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

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

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

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

2.4.4 Categorization of "relevant" articles at full text level

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

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

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

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

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

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

2.5 Reliability assessment

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

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

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

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

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

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

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

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

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

3 SEARCH RESULTS

The full outcome of the literature search is provided below.

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

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

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

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

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

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

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

Table 25: Results of the article selection process for ecotoxicology

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

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

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

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

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

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

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

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

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

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

Table 27: Results of the article selection process for residues

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

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

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

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

Table 28: Results of the article selection process for toxicology

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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