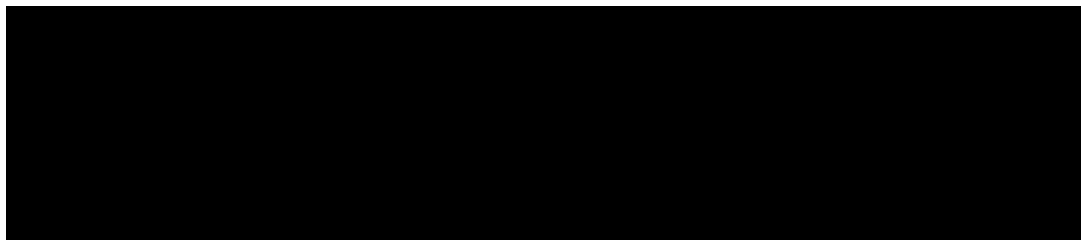


**Review of literature for authorised genetically modified maize products  
in the scope of their authorisations for food and feed uses, import and  
processing  
(2023 update)**



**Products covered:**

**Single events**

1507  
59122  
4114  
DAS-40278-9

**Stacks**

1507 × NK603  
1507 × 59122 × MON810 × NK603  
1507 × MIR162 × MON810 × NK603  
MON89034 × 1507 × MON88017 × 59122 × DAS-  
40278-9  
MON89034 × 1507 × NK603 × DAS-40278-9  
NK603 × T25 × DAS-40278-9  
DP4114 × MON 810 × MIR604 × NK603  
and their subcombinations covered by the  
authorisations

**PHI-R178-Y23**

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## 1. Summary

An updated systematic search and review of peer-reviewed literature was conducted for the authorised genetically modified (GM) maize 1507, 59122, 4114, DAS-40278-9, 1507 × NK603, 1507 × 59122 × MON810 × NK603, 1507×MIR162×MON810×NK603, MON89034 × 1507 × MON88017 × 59122 × DAS-40278-9, MON89034 × 1507 × NK603 × DAS-40278-9, NK603 × T25 × DAS-40278-9, DP4114 × MON 810 × MIR604 × NK603 and their sub-combinations covered by their respective authorisations<sup>1</sup> (hereafter collectively referred to as “authorised GM maize”). This exercise was performed in line with the EFSA Guidance on conducting a systematic review (EFSA, 2010) and taking into account the explanatory note on literature searching (EFSA, 2019), with the following review question “Do the authorised GM maize<sup>2</sup> and derived food/feed products, or the intended traits (the newly expressed proteins or their combination) have adverse effects on human and animal health and the environment in the scope of their authorisations?”.

The current systematic search complements the search performed in 2022. Unless indicated below, all portions of the search were conducted according to the methodologies outlined in the previous searches.

The outcome of this analysis showed that one publication relevant for the review question was identified (notably for 1507 maize) during the selected time period. No safety concerns were identified for the authorised GM maize by this literature search exercise.

## 2. Confirmation of the Suitability of the Search Strings

All updates are related to the inclusion of products that were approved since the last reporting period (NK603 × T25 × DAS-40278-9, DP4114 × MON 810 × MIR604 × NK603 and sub-combinations). The included search terms were extracted from search strategies previously submitted to EFSA. Introduced updates were for consistency or to fine tune the syntaxes to the

<sup>1</sup> 1507 × 59122 × MON810 × NK603 maize and the following subcombinations: 1507 × 59122 × MON810, 59122 × 1507 × NK603, 1507 × MON810 × NK603, 59122 × MON810 × NK603, 1507 × 59122, 1507 × MON810, 59122 × MON810, 59122 × NK603.

1507×MIR162×MON810×NK603 and the following subcombinations: 1507×MIR162×MON810, 1507×MIR162×NK603, MIR162×MON810×NK603, MIR162×MON810

MON89034 × 1507 × MON88017 × 59122 × DAS-40278-9 and the following subcombinations: MON89034 × 1507 × MON88017 × DAS-40278-9, MON89034 × 1507 × 59122 × DAS-40278-9, MON89034 × MON88017 × 59122 × DAS-40278-9, 1507 × MON88017 × 59122 × DAS-40278-9, MON89034 × 1507 × DAS-40278-9, MON89034 × MON88017 × DAS-40278-9, MON89034 × 59122 × DAS-40278-9, 1507 × MON88017 × DAS-40278-9, 1507 × 59122 × DAS-40278-9, MON88017 × 59122 × DAS-40278-9, MON89034 × DAS-40278-9, 1507 × DAS-40278-9, MON88017 × DAS-40278-9, 59122 × DAS-40278-9.

MON89034 × 1507 × NK603 × DAS-40278-9 and the following subcombinations: MON89034 × NK603 × DAS-40278-9, 1507 × NK603 × DAS-40278-9 and NK603 × DAS-40278-9.

NK603 × T25 × DAS-40278-9 and the following subcombination: T25 × DAS-40278-9.

DP4114 × MON 810 × MIR604 × NK603 and the following subcombinations: MIR604 × NK603 × DP4114, MON 810 × NK603 × DP4114, MON 810 × MIR604 × DP4114, MON 810 × MIR604 × NK603, NK603 × DP4114, MIR604 × DP4114, MIR604 × NK603, MON 810 × DP4114, MON 810 × MIR604.

<sup>2</sup> As previously defined, 1507, 59122, 4114, DAS-40278-9, 1507 × NK603, 1507 × 59122 × MON810 × NK603, 1507×MIR162×MON810×NK603, MON89034 × 1507 × MON88017 × 59122 × DAS-40278-9, MON89034 × 1507 × NK603 × DAS-40278-9, NK603 × T25 × DAS-40278-9, DP4114 × MON 810 × MIR604 × NK603 maize and their sub-combinations covered by their respective authorisations.

databases queried. It was confirmed that searches on the single events would find results on the stack events covered by the authorisations. In addition, specific terms for relevant sub-combinations were added to the search strings when those terms were not already covered by single event terms. As the updated search is as sensitive and not more specific than the previous searches, no additional validation was conducted.

### 3. Results of the scoping exercise

#### 3.1. Outcome of the literature searches

In May 2023, searches against electronic bibliographic databases and manual searches in view of screening of reference lists were performed. The search process is reported in line with EFSA guidance (EFSA, 2010 Appendix B4(2)) in Table 1.

**Table 1.** Documenting and reporting the search process

Resources	Date of search	Period searched*	Other restrictions	Number of records retrieved
Web of Science Core collection <sup>§</sup>	26 May 2023	1 Jan 2022-26 May 2023	None	94
CAB Abstracts <sup>§</sup>	26 May 2023	1 Jan 2022-26 May 2023	None	99
MEDLINE <sup>§</sup>	26 May 2023	1 Jan 2022-26 May 2023	None	53
Europe PMC <sup>§</sup>	26 May 2023	1 Jan 2022-26 May 2023	None	14
Screening reference lists	NA	-	NA	NA

<sup>§</sup> The search syntaxes used for electronic bibliographic databases are reported in Appendix 1.

\* Period searched included an indexing date of 8 August 2022.

NA: Not applicable as no publications relevant for screening reference lists were identified.

The publications retrieved across all methods of searching (Web of Science Core collection, CAB Abstracts, MEDLINE, Europe PMC, and screening of reference lists) can be found in Appendix 3.

In the framework of the reference list screening exercise, no detailed risk assessments regarding the authorised GM maize were retrieved that contained information on food and feed safety. Considering that no relevant opinions were published within the selected time period, no further screening was performed.

The publications grouped in the Endnote® library were deduplicated and publications retrieved by the previous searches conducted in the frame of the 2022 annual monitoring reports were removed (see Appendix 3).

The results of the publication selection process are presented in Table 2.

**Table 2.** Results of the publication selection process, for the review question

<b>Review question:</b> “Do the authorised GM maize and their respective derived food/feed products, or the intended trait(s) (the newly expressed protein(s) or their combination), have adverse effects on human and animal health and the environment in the scope of their authorisations?”	<b>Number of records</b>
Total number of publications retrieved after all searches of the scientific literature (excluding duplicates and publications retrieved by the previous searches conducted in the frame of the 2022 monitoring reports)	160
Number of publications excluded from the search results after rapid assessment for relevance based on title and abstract	158
Total number of full-text documents assessed in detail	2
Number of publications excluded from further consideration after detailed assessment for relevance based on full text	1
Total number of unobtainable/unclear publications	0
Total number of relevant publications	1

The 160 unique entries present in the Endnote database (Table 2) were manually screened for relevance to the review question by two independent reviewers using the *a priori* eligibility/inclusion criteria described in Appendix 2.

In the first stage of screening, entries were screened based on title/abstract. Records that were deemed to be irrelevant were not further retained. In cases where the record seemed relevant, or if the title/abstract did not contain sufficient information, the publication was progressed to the second stage and assessed for relevance at the level of the full text.

Publications assessed at full text level and found not to be relevant were not further assessed and a justification was provided. Records that are relevant were summarized and their potential to influence the initial risk assessment was evaluated in the format laid out by the Commission decision 2009/770/EC (EC, 2009).

In this literature search exercise, one peer-reviewed publication relevant to the risk assessment of the authorised GM maize (notably for 1507 maize) was identified (Rodriguez et al., 2022) (see Table 4.1 in Appendix 4 and Table 3 hereafter). Publications excluded after assessment of the full-text are presented in Table 4.2 in Appendix 4 and a reason for exclusion based on the eligibility/inclusion criteria is provided. No unclear publications were identified (see Appendix 4, Table 4.3).

**Table 3:** Review of a relevant peer-reviewed publication: Food/Feed safety (59122 maize) (Gyurcsó et al., 2022)

Publication	Summary of research and results	Protection goal	Observed parameter	Adverse effects	Feedback on initial risk assessment
Rodriguez HDS, Duarte DAB, Chaparro-Giraldo A and Acosta O, <b>2022</b> . Equivalence of grain and forage composition in corn hybrid ( <i>Zea mays</i> L.) from genetically modified off-patent (event TC1507) and non-genetically modified conventional corn. <i>Agronomía Colombiana</i> 40, 155-164. <a href="http://dx.doi.org/10.15446/agron.colomb.v40n2.98948">http://dx.doi.org/10.15446/agron.colomb.v40n2.98948</a>	This study aims to evaluate the substantial equivalence of the hybrid obtained through the backcrossing method using elite Colombian corn lines crossed with Herculex® I corn (GM corn event TC1507). A field trial to obtain grain and forage samples for compositional analysis was carried out, consisting of 6 genotypes: the Hybrid Transgenic line of Colombian corn x TC1507 (HT), Transgenic line I (T1) and Transgenic line II (T2) of off-patent maize TC1507 event; the non-transgenic control samples lines were Hybrid Conventional (HC), Conventional line I (C1) and Conventional line II (C2) of elite Colombian corn lines. The levels of the nutritional components of the proximal analytes in the grain and forage tissues involving the off-patent genotypes (event TC1507) of GM corn plants were compared with the conventional corn genotypes from which they were derived. No significant biological differences were found between off-patent TC1507 event corn and non-transgenic conventional corn. Therefore, the off-patent hybrid is substantially equivalent from a compositional point of view to its conventional counterpart, except for the genetically engineered characteristics.	Food Feed safety	Nutrition	None	No change

#### **4. Conclusion**

One publication was identified as relevant for the molecular characterisation, food/feed and environmental safety of the authorised GM maize (notably for 1507 maize) within the scope of the authorisations for the defined time period. No safety concerns have been identified for the authorised GM maize by this literature search exercise.

#### **References**

- EC, **2009**. Commission Decision 2009/770/EC of 13 October 2009 establishing standard reporting formats for presenting the monitoring results of the deliberate release into the environment of genetically modified organisms, as or in products, for the purpose of placing on the market, pursuant to Directive 2001/18/EC of the European Parliament and of the Council. Official Journal of the European Union 275, 9-27.
- EFSA, **2010**. Application of systematic review methodology to food and feed safety assessments to support decision making. EFSA Journal 8(6):1637. [90 pp.].
- EFSA, **2019**. Explanatory note on literature searching conducted in the context of GMO applications for (renewed) market authorisation and annual post-market environmental monitoring reports on GMOs authorised in the EU market. EFSA supporting publication 2019:EN-1614. [62 pp.].
- Gyurcsó G, Darvas B, Baska F, Simon L, Takacs E, Klatyik S and Szekacs A, **2022**. Herbivorous Juvenile Grass Carp (*Ctenopharyngodon idella*) Fed with Genetically Modified MON 810 and DAS-59122 Maize Varieties Containing Cry Toxins: Intestinal Histological, Developmental, and Immunological Investigations. Toxins 14. 10.3390/toxins14020153.

# Appendix 1. Detailed search syntaxes for the authorised GM maize

## Web of Science Core collection

Set	Search query	Results
Event 1507 #1	TS=(tc1507* OR das-01507-1 OR das01507* OR DAS-Ø15Ø7 OR DAS-circle-divide-15-circle-divide-7 OR DAS-empty-set15empty set7 OR das-01507 OR tc-1507 OR (1507 AND (maize OR corn OR zea OR mays OR Dupont OR Dow OR Pioneer OR Corteva)) OR herculex* or hx-corn or hx-maize)	161
Event 59122 #2	TS=((59122 AND (maize OR corn OR zea OR mays OR DuPont OR dow OR pioneer OR corteva)) OR das59122* OR das-59122 OR herculex-rw OR (herculex and rootworm) OR (hx AND rw))	113
Event 4114 #3	TS=(DP-ØØ4114 OR DP-circle-divide-circle-divide-4114 OR DP-empty-setempty-set4114 OR dp-004114 OR dp004114* OR DP4114 OR (4114 AND (maize OR corn OR zea OR mays OR Dupont OR Corteva)))	5
Event DAS-40278-9 #4	TS=(DAS40278* OR DAS-40278 OR DAS-4Ø278-9 OR DAS-4-circle-divide-278-9 OR DAS-4empty-set278-9 OR (Enlist* AND (maize OR corn OR zea OR mays OR dow OR Corteva OR herbicid*)))	77
Stack and relevant subcombinations #5	TS=(*1507x59122xMON810xNK603* OR *1507x59122xMON810* OR *1507x59122xNK603* OR *59122x1507xNK603* OR *1507xMON810xNK603* OR *59122xMON810xNK603* OR *1507x59122* OR *1507xMON810* OR *1507xNK603* OR *59122xMON810* OR *59122xNK603* OR *MON89034x1507xNK603xDAS-40278-9* OR *MON89034xNK603xDAS-40278-9* OR *1507xNK603xDAS-40278-9* OR *MON89034x1507xMON88017x59122xDAS-40278-9* OR *MON89034x1507xMON88017xDAS-40278-9* OR *MON89034x1507x59122xDAS-40278-9* OR *1507xMON88017x59122xDAS-40278-9* OR *MON89034x1507xDAS-40278-9* OR *MON89034xMON88017xDAS-40278-9* OR *MON89034x59122xDAS-40278-9* OR *1507xMON88017xDAS-40278-9* OR *1507x59122xDAS-40278-9* OR *MON88017x59122xDAS-40278-9* OR *MON89034xDAS-40278-9* OR *1507xDAS-40278-9* OR *MON88017xDAS-40278-9* OR *59122xDAS-40278-9* OR *1507xMON810xMIR162xNK603* OR *1507xMON810xMIR162* OR *1507xMIR162xNK603* OR *MON810xMIR162xNK603* OR *1507xMIR162* OR *MON810xMIR162* OR *MON810xNK603* OR	13



	*NK603xMON810* OR *MIR162xNK603* OR *NK603xT25xDAS-40278-9* OR *NK603xT25* OR *T25xDAS-40278-9* OR *DP4114xMON810xMIR604xNK603* OR *DP4114xMON810xMIR604* OR *DP4114xMON810xNK603* OR *MON810xMIR604xNK603* OR *DP4114xMON810* OR *DP4114xMIR604* OR *DP4114xNK603* OR *MON810xmir604* OR *MIR604xNK603* OR leptra OR acremax OR smartstax*-enlist* OR Powercore*-enlist* OR intrasect)	
#6	#1 OR #2 OR #3 OR #4 OR #5	321
Protein 1507 #7	TS=(cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin))	765
Protein 59122 #8	TS=(cry34ab1 OR cry34* OR cry35ab1 OR cry35* OR cry-34 OR cry-35 OR cry-34a* OR cry-35a* OR (phosphinothricin AND (acetyltransferase OR acetyl- transferase)) OR (pat AND phosphinothricin))	486
Protein 4114 #9	TS=(cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR cry34ab1 OR cry34* OR cry35ab1 OR cry35* OR cry-34 OR cry-35 OR cry-34a* OR cry-35a*)	867
Protein DAS-40278-9 #10	TS=(aad-1 OR aryloxyalkanoate-dioxygenase-1)	72
General #11	TS=(Streptomyces OR viridochromogenes OR sphingobium OR herbicidovorans OR Bacillus OR thuringiensis OR bt OR maize OR corn OR zea OR mays OR (((herbicid* AND (genetic* NEAR/3 (modif* or engineer*))) OR GMHT) AND (crop OR plant OR food OR feed)) OR gmo OR gmos OR lmo OR lmos OR gm OR ge OR stack)	976,561
#12	(#7 OR #8 OR #9 OR #10) AND #11	687
Trait 1507 #13	TS=(lepidopter* OR ecb OR corn-borer OR cornborer OR ostrinia OR nubilalis OR CEW OR earworm OR helicoverpa OR cutworm OR spodoptera OR frugiperda OR fall-armyworm OR FAW OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*))	88,022
Trait 59122 #14	TS=(coleopter* OR rootworm* OR root-worm* OR virgifera OR WCR OR barberi OR NCR OR diabrotica* OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*))	83,289

Trait 4114 #15	TS=(lepidopter* OR ecb OR corn-borer OR cornborer OR ostrinia OR nubilalis OR CEW OR earworm OR helicoverpa OR cutworm OR spodoptera OR frugiperda OR fall-armyworm OR FAW OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*) OR coleopter* OR rootworm* OR root-worm* OR diabrotica OR virgifera OR WCR OR barberi OR NCR)	162,704
Trait DAS-40278-9 #16	TS=((((2-4-D OR AOPP) AND herbicid*) OR 2-4-dichlorophenoxyacetic-acid OR 2-4-dichlorophenoxy-acetic-acid OR aryloxyphenoxypropionate OR aryloxyphenoxy-propionate OR (fop AND (herbicid* or aryloxyphen*)) OR quizalofop OR haloxyfop)	11,631
General #17	TS=((toler* OR resist* OR protec*) AND (maize OR corn OR zea OR mays) AND (GMO OR GMOS OR LMO OR LMOS OR living-modified OR transgen* OR GMHT OR ((GM OR GE OR genetic*) NEAR/3 (modif* OR transform* OR manipul* OR engineer* OR stack))))	5326
#18	(#13 OR #14 OR #15 OR #16) AND #17	2007
Reporting Period #19	PY=(2022-2100) (and added to the database on or since date of 2022 PMEM search ran on Aug 8)	2,578,163
<b>Final Results</b> #20	(#6 OR #12 OR #18) AND #19	94

# CAB Abstracts

Set	Search query	Results
Event 1507 #1	TS=(tc1507* OR das-01507-1 OR das01507* OR DAS-Ø15Ø7 OR DAS-<o>15<o>7 OR das-01507 OR tc-1507 OR (1507 AND (maize OR corn OR zea OR mays OR Dupont OR Dow OR Pioneer OR Corteva)) OR herculex* or hx-corn or hx-maize)	228
Event 59122 #2	TS=((59122 AND (maize OR corn OR zea OR mays OR DuPont OR dow OR pioneer OR corteva)) OR das59122* OR das-59122 OR herculex-rw OR (herculex and rootworm) OR (hx AND rw))	75
Event 4114 #3	TS=(DP-ØØ4114 OR DP-<o><o>4114 OR dp-004114 OR dp004114* OR DP4114 OR (4114 AND (maize OR corn OR zea OR mays OR Dupont OR Corteva)))	6
Event DAS-40278-9 #4	TS=(DAS40278* OR DAS-40278 OR DAS-4Ø278-9 OR DAS-4<o>278-9 OR (Enlist* AND (maize OR corn OR zea OR mays OR dow OR Corteva OR herbicid*)))	90
Stack and relevant subcombinations #5	TS=(*1507x59122xMON810xNK603* OR *1507x59122xMON810* OR *1507x59122xNK603* OR *59122x1507xNK603* OR *1507xMON810xNK603* OR *59122xMON810xNK603* OR *1507x59122* OR *1507xMON810* OR *1507xNK603* OR *59122xMON810* OR *59122xNK603* OR *MON89034x1507xNK603xDAS-40278-9* OR *MON89034xNK603xDAS-40278-9* OR *1507xNK603xDAS-40278-9* OR *MON89034x1507xMON88017x59122xDAS-40278-9* OR *MON89034x1507xMON88017xDAS-40278-9* OR *MON89034x1507x59122xDAS-40278-9* OR *1507xMON88017x59122xDAS-40278-9* OR *MON89034x1507xDAS-40278-9* OR *MON89034xMON88017xDAS-40278-9* OR *MON89034x59122xDAS-40278-9* OR *1507xMON88017xDAS-40278-9* OR *1507x59122xDAS-40278-9* OR *MON88017x59122xDAS-40278-9* OR *MON89034xDAS-40278-9* OR *1507xDAS-40278-9* OR *MON88017xDAS-40278-9* OR *59122xDAS-40278-9* OR *1507xMON810xMIR162xNK603* OR *1507xMON810xMIR162* OR *1507xMIR162xNK603* OR *MON810xMIR162xNK603* OR *1507xMIR162* OR *MON810xMIR162* OR *MON810xNK603* OR *NK603xMON810* OR *MIR162xNK603* OR *NK603xT25xDAS-40278-9* OR *NK603xT25* OR *T25xDAS-40278-9* OR *DP4114xMON810xMIR604xNK603* OR *DP4114xMON810xMIR604* OR	13

	*DP4114xMON810xNK603* OR *MON810xMIR604xNK603* OR *DP4114xMON810* OR *DP4114xMIR604* OR *DP4114xNK603* OR *MON810xmir604* OR *MIR604xNK603* OR lepra OR acremax OR smartstax*-enlist* OR Powercore*-enlist* OR intrasect)	
#6	#1 OR #2 OR #3 OR #4 OR #5	367
Protein 1507 #7	TS=(cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin))	806
Protein 59122 #8	TS=(cry34ab1 OR cry34* OR cry35ab1 OR cry35* OR cry-34 OR cry-35 OR cry-34a* OR cry-35a* OR (phosphinothricin AND (acetyltransferase OR acetyl- transferase)) OR (pat AND phosphinothricin))	559
Protein 4114 #9	TS=(cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR cry34ab1 OR cry34* OR cry35ab1 OR cry35* OR cry-34 OR cry-35 OR cry-34a* OR cry-35a*)	896
Protein DAS-40278-9 #10	TS=(aad-1 OR aryloxyalkanoate-dioxygenase-1)	22
General #11	TS=(Streptomyces OR viridochromogenes OR sphingobium OR herbicidovorans OR Bacillus OR thuringiensis OR bt OR maize OR corn OR zea OR mays OR (((herbicid* AND (genetic* NEAR/3 (modif* or engineer*))) OR GMHT) AND (crop OR plant OR food OR feed)) OR lmo OR lmos OR ge OR "genetically engineered foods" OR stack)	795,203
#12	(#7 OR #8 OR #9 OR #10) AND #11	766
Trait 1507 #13	TS=(lepidopter* OR ecb OR corn-borer OR cornborer OR ostrinia OR nubilalis OR CEW OR earworm OR helicoverpa OR cutworm OR spodoptera OR frugiperda OR fall-armyworm OR FAW OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*))	229,360
Trait 59122 #14	TS=(coleopter* OR rootworm* OR root-worm* OR virgifera OR WCR OR barberi OR NCR OR diabrotica* OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*))	191,636
Trait 4114 #15	TS=(lepidopter* OR ecb OR corn-borer OR cornborer OR ostrinia OR nubilalis OR CEW OR earworm OR helicoverpa OR cutworm OR spodoptera OR frugiperda OR fall-armyworm OR FAW OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*) OR coleopter*	392,276

	OR rootworm* OR root-worm* OR diabrotica OR virgifera OR WCR OR barberi OR NCR)	
Trait DAS- 40278-9 #16	TS=((((2-4-D OR AOPP) AND herbicid*) OR 2-4- dichlorophenoxyacetic-acid OR 2-4-dichlorophenoxy- acetic-acid OR aryloxyphenoxypropionate OR aryloxyphenoxy-propionate OR (fop AND (herbicid* or aryloxyphen*)) OR quizalofop OR haloxyfop)	46,363
General #17	TS=((toler* OR resist* OR protec*) AND (maize OR corn OR zea OR mays) AND (GMHT OR transgen* OR engineer* OR lmo or lmos OR ge OR manipul* OR transform* OR stack OR "genetically engineered foods"))	6275
#18	(#13 OR #14 OR #15 OR #16) AND #17	2155
Reporting Period #19	PY=(2022-2100) (and added to the database on or since date of 2022 PMEM search ran on Aug 8)	360,901
<b>Final Results</b> #20	(#6 OR #12 OR #18) AND #19	99

## MEDLINE

Set	Search query	Results
Event 1507 #1	TS=(tc1507* OR das-01507-1 OR das01507* OR DAS-Ø15Ø7 OR das-01507 OR tc-1507 OR (1507 AND (maize OR corn OR zea OR mays OR Dupont OR Dow OR Pioneer OR Corteva)) OR herculex* or hx-corn or hx-maize)	78
Event 59122 #2	TS=((59122 AND (maize OR corn OR zea OR mays OR DuPont OR dow OR pioneer OR corteva)) OR das59122* OR das-59122 OR herculex-rw OR (herculex and rootworm) OR (hx AND rw))	40
Event 4114 #3	TS=(DP-ØØ4114 OR dp-004114 OR dp004114* OR DP4114 OR (4114 AND (maize OR corn OR zea OR mays OR Dupont OR Corteva)))	5
Event DAS-40278-9 #4	TS=(DAS40278* OR DAS-40278 OR DAS-4Ø278-9 OR (Enlist* AND (maize OR corn OR zea OR mays OR dow OR Corteva OR herbicid*)))	30
Stack and relevant subcombinations #5	TS=(*1507x59122xMON810xNK603* OR *1507x59122xMON810* OR *1507x59122xNK603* OR *59122x1507xNK603* OR *1507xMON810xNK603* OR *59122xMON810xNK603* OR *1507x59122* OR *1507xMON810* OR *1507xNK603* OR *59122xMON810* OR *59122xNK603* OR *MON89034x1507xNK603xDAS-40278-9* OR *MON89034xNK603xDAS-40278-9* OR *1507xNK603xDAS-40278-9* OR *MON89034x1507xMON88017x59122xDAS-40278-9* OR *MON89034x1507xMON88017xDAS-40278-9* OR *MON89034x1507x59122xDAS-40278-9* OR *1507xMON88017x59122xDAS-40278-9* OR *MON89034x1507xDAS-40278-9* OR *MON89034xMON88017xDAS-40278-9* OR *MON89034x59122xDAS-40278-9* OR *1507xMON88017xDAS-40278-9* OR *1507x59122xDAS-40278-9* OR *MON88017x59122xDAS-40278-9* OR *MON89034xDAS-40278-9* OR *1507xDAS-40278-9* OR *MON88017xDAS-40278-9* OR *59122xDAS-40278-9* OR *1507xMON810xMIR162xNK603* OR *1507xMON810xMIR162* OR *1507xMIR162xNK603* OR *MON810xMIR162xNK603* OR *1507xMIR162* OR *MON810xMIR162* OR *MON810xNK603* OR *NK603xMON810* OR *MIR162xNK603* OR *NK603xT25xDAS-40278-9* OR *NK603xT25* OR *T25xDAS-40278-9* OR *DP4114xMON810xMIR604xNK603* OR *DP4114xMON810xMIR604* OR	11

	*DP4114xMON810xNK603* OR *MON810xMIR604xNK603* OR *DP4114xMON810* OR *DP4114xMIR604* OR *DP4114xNK603* OR *MON810xmir604* OR *MIR604xNK603* OR lepra OR acremax OR smartstax*-enlist* OR Powercore*-enlist* OR intrasect)	
#6	#1 OR #2 OR #3 OR #4 OR #5	136
Protein 1507 #7	TS=(cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin))	460
Protein 59122 #8	TS=(cry34ab1 OR cry34* OR cry35ab1 OR cry35* OR cry-34 OR cry-35 OR cry-34a* OR cry-35a* OR (phosphinothricin AND (acetyltransferase OR acetyl- transferase)) OR (pat AND phosphinothricin))	320
Protein 4114 #9	TS=(cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR cry34ab1 OR cry34* OR cry35ab1 OR cry35* OR cry-34 OR cry-35 OR cry-34a* OR cry-35a*)	541
Protein DAS-40278-9 #10	TS=(aad-1 OR aryloxyalkanoate-dioxygenase-1)	23
General #11	TS=(Streptomyces OR viridochromogenes OR sphingobium OR herbicidovorans OR Bacillus OR thuringiensis OR bt OR maize OR corn OR zea OR mays OR (((herbicid* AND (genetic* NEAR/3 (modif* or engineer*))) OR GMHT) AND (crop OR plant OR food OR feed)) OR lmo OR lmos OR ge OR "Food, Genetically Modified" OR stack)	351,061
#12	(#7 OR #8 OR #9 OR #10) AND #11	442
Trait 1507 #13	TS=(lepidopter* OR ecb OR corn-borer OR cornborer OR ostrinia OR nubilalis OR CEW OR earworm OR helicoverpa OR cutworm OR spodoptera OR frugiperda OR fall-armyworm OR FAW OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*))	35,475

Trait 59122 #14	TS=(coleopter* OR rootworm* OR root-worm* OR virgifera OR WCR OR barberi OR NCR OR diabrotica* OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*))	27,143
Trait 4114 #15	TS=(lepidopter* OR ecb OR corn-borer OR cornborer OR ostrinia OR nubilalis OR CEW OR earworm OR helioverpa OR cutworm OR spodoptera OR frugiperda OR fall-armyworm OR FAW OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*) OR coleopter* OR rootworm* OR root-worm* OR diabrotica OR virgifera OR WCR OR barberi OR NCR)	60,884
Trait DAS-40278-9 #16	TS=((((2-4-D OR AOPP) AND herbicid*) OR 2-4-dichlorophenoxyacetic-acid OR 2-4-dichlorophenoxy-acetic-acid OR aryloxyphenoxypropionate OR aryloxyphenoxy-propionate OR (fop AND (herbicid* or aryloxyphen*)) OR quizalofop OR haloxyfop)	5501
General #17	TS=((toler* OR resist* OR protec*) AND (maize OR corn OR zea OR mays) AND (GMHT OR transgen* OR engineer* OR lmo or lmos OR ge OR manipul* OR transform* OR stack OR "Food, Genetically Modified"))	2332
#18	(#13 OR #14 OR #15 OR #16) AND #17	661
Reporting Period #19	PY=(2022-2100) (and added to the database on or since date of 2022 PMEM search ran on Aug 8)	1,257,479
<b>Final Results</b> #20	(#6 OR #12 OR #18) AND #19	53



## Europe PMC

(1507x59122xMON810xNK603 OR 1507x59122xMON810 OR 1507x59122xNK603 OR 1507xMON810xNK603 OR 59122xMON810xNK603 OR 1507x59122 OR 1507xMON810 OR 1507xNK603 OR 59122xMON810 OR 59122xNK603 OR “MON89034x1507xNK603xDAS-40278” OR “MON89034xNK603xDAS-40278” OR “1507xNK603xDAS-40278” OR “MON89034x1507xMON88017x59122xDAS-40278” OR “MON89034x1507xMON88017xDAS-40278” OR “MON89034x1507x59122xDAS-40278” OR “1507xMON88017x59122xDAS-40278” OR “MON89034x1507xDAS-40278” OR “MON89034xMON88017xDAS-40278” OR “MON89034x59122xDAS-40278” OR “1507xMON88017xDAS-40278” OR “1507x59122xDAS-40278” OR “MON88017x59122xDAS-40278” OR “MON89034xDAS-40278” OR “1507xDAS-40278” OR “MON88017xDAS-40278” OR “59122xDAS-40278” OR “1507xMON810xMIR162xNK603” OR “1507xMON810xMIR162” OR “1507xMIR162xNK603” OR “MON810xMIR162xNK603” OR “1507xMIR162” OR “MON810xMIR162” OR “MON810xNK603” OR “NK603xMON810” OR “MIR162xNK603” OR “NK603xT25xDAS-40278-9” OR NK603xT25 OR “T25xDAS-40278-9” OR DP4114xMON810xMIR604xNK603 OR DP4114xMON810xMIR604 OR DP4114xMON810xNK603 OR MON810xMIR604xNK603 OR DP4114xMON810 OR DP4114xMIR604 OR DP4114xNK603 OR MON810xmir604 OR \*MIR604xNK603\* OR tc1507 OR “tc-1507” OR DAS01507 OR “DAS-01507” OR DASØ15Ø7 OR “DAS-Ø15Ø7” OR “1507 corn” OR “1507 maize” OR “maize 1507” OR “corn 1507” OR das59122 OR “das-59122” OR “59122 corn” OR “59122 maize” OR “maize 59122” OR “corn 59122” OR “DP-ØØ4114” OR “dp-004114” OR dp004114 OR DP4114 OR DAS40278 OR “DAS-40278” OR DAS4Ø278 OR “DAS-4Ø278” OR “40278 corn” OR “40278 maize” OR “maize 40278” OR “corn 40278”) AND (FIRST\_PDATE:[2022-01-01 TO 2100-12-31]) AND (FIRST\_IDATE:[2022-08-08 TO 2100-12-31])

= 14 results

## Appendix 2. Eligibility/Inclusion Criteria<sup>3</sup>

Concept	Criteria
Population (taking into account scope of the authorisation)	<p>Publication addressing human and animal health, and/or the environment relevant for the scope of the authorisation.</p> <p>The pathways and level of exposure to the GMO, derived food/feed products, and the intended traits addressed in the study (as assessed under the <b>Intervention/exposure</b> part) are relevant for the intended uses of the GMO and derived food/feed products under regulatory review (e.g. in case of an authorisation for food, food, import, efficacy of the traits, pest susceptibility, etc. are not considered relevant).</p>
Intervention/exposure	Publication addressing authorised GM maize and derived food/feed products, and/or the intended traits (newly expressed protein(s) or their combination, when applicable).
Intervention/exposure Plant species	In case of studies using GM plants, only studies using maize are considered eligible. This criterion is not employed for studies regarding the newly expressed proteins.
Intervention/exposure Source organism of the protein	In case of publications using the protein of interest, only publications with the protein from the specific source organism will be considered eligible.
Comparator	If the study is a comparative study that uses plant material as test material, eligible publications must report a non-GM variety.
Outcomes	<p>Effects/impacts on human and animal health, and/or the environment are addressed.</p> <p>Publications addressing other issues such as benefits, socio-economics, ethics, crop protection, detection methods, efficacy, public perception and risk communication are to be excluded using this criterion, as they are not relevant to the risk assessment of GMOs.</p>
Reporting format	<p>Original/primary data are presented in the study. This permits the exclusion of publications that do not present original/primary data (e.g., reviews, editorial, position papers).</p> <p>However, risk assessments from relevant risk assessment bodies (excluding EFSA) will not be excluded.</p>

<sup>3</sup> This table is provided for ease of reference, no updates have been introduced since the previous report.

### **Appendix 3. New entries retrieved by the performed searches to literature databases for the authorised GM maize within the indicated search period (excluding duplicates retrieved by the previous searches conducted in 2022)**

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#### Appendix 4. Publications screened for relevance based on the full text

**Table 4.1.** Report of all relevant publications retrieved after detailed assessment of full-text documents for relevance

Category of information/ data requirement(s)	Reference (Author, year, title, source)
Nutritional assessment of changes in the levels of food/feed constituents	Rodriguez HDS, Duarte DAB, Chaparro-Giraldo A and Acosta O, <b>2022</b> . Equivalence of grain and forage composition in corn hybrid ( <i>Zea mays</i> L.) from genetically modified off-patent (event TC1507) and non-genetically modified conventional corn. <i>Agronomia Colombiana</i> 40, 155-164. <a href="http://dx.doi.org/10.15446/agron.colomb.v40n2.98948">http://dx.doi.org/10.15446/agron.colomb.v40n2.98948</a>

**Table 4.2.** Report of publications excluded from the risk assessment after detailed assessment of full-text documents

Reference (Author, year, title, source)	Reason(s) for exclusion based on eligibility/inclusion criteria listed in Appendix 2
Organisms EPoGM, Mullins E, Bresson J-L, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Naegeli H, Nogu�� F, Rostoks N, S��nchez Serrano JJ, Savoini G, Veromann E, Veronesi F, Gennaro A, Neri FM and Papadopoulou N, <b>2023</b> . Risk assessment of additional information on maize MIR162. In: EFSA journal European Food Safety Authority. p e07935. ^ <a href="http://dx.doi.org/10.2903/j.efsa.2023.7935">http://dx.doi.org/10.2903/j.efsa.2023.7935</a>	Reporting format (not a primary study) Intervention/exposure (not on authorised stack GM maize)

**Table 4.3.** Report of unobtainable/unclear publications

Reference (Author, year, title, source)	Description of (unsuccessful) methods used to try to obtain a copy of the publication
None	Not applicable