APPENDIX 3

LITERATURE SEARCH TO SUPPORT GENERAL SURVEILLANCE OF 2022/2023 ANNUAL POST MARKET ENVIRONMENTAL MONITORING REPORTS OF BAYER GM SOYBEAN PRODUCTS

Data protection.
This application contains scientific data and other information which are protected in accordance with Art. 31 of Regulation (EC) No 1829/2003.

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SUMMARY

The literature search was conducted in accordance with the 2019 EFSA explanatory note on literature searching conducted in the context of GMO applications[1,2] to support general surveillance of 2022/2023 annual post market environmental monitoring reports. It addresses the review question "Do Bayer GM soybean products, derived food/feed products and their respective introduced traits have adverse effects on human and animal health and the environment?".

Eligibility/inclusion criteria to establish the relevance of retrieved publications was determined following the criteria described in the 2019 EFSA explanatory note on literature searching[2]. Literature searching for Bayer GM soybean products was conducted in electronic bibliographic databases and internet pages of relevant key organisations.

In line with the requirements in the 2019 EFSA explanatory note on literature searching[2] the literature search covered the time span 2022 – 2023 to capture any publication published during the annual general surveillance of 2022/2023 post market environmental monitoring season.

The literature search retrieved 5 publications as relevant. These publications did not have any implication on the risk assessment, because no new hazard, modified exposure, or new scientific uncertainty is reported.

The comprehensive literature search found no new information that would invalidate the conclusions of the risk assessment for Bayer GM soybean products.

[1] Hereafter referred to as 2019 EFSA explanatory note on literature searching.

[2] 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 - Note on literature searching to GMO risk assessment guidance. EFSA journal, 2019:EN-1614, 1-62. – Accessed on 18 September 2023

1. INTRODUCTION

As part of the general surveillance requirements for Bayer GM soybean products authorised in the European Union (EU) market under regulation (EC) No 1829/2003, Bayer Agriculture BV[3] has actively monitored the soybean products by conducting quarterly literature searches covering the time span between June 2022 and May 2023.

The results of the literature search that were analysed in detail according to the relevance for the risk assessment of the Bayer GM soybean products are presented here.

The Appendix completeness checklist is provided with this report.

2. FORMULATING THE REVIEW QUESTION AND CLARIFYING ITS PURPOSE

This literature search has been conducted to address the review question "Do Bayer GM soybean products, derived food/feed products and respective introduced traits have adverse effects on human and animal health and the environment?"

The purpose for undertaking this literature search is to support general surveillance of 2022/2023 annual post market environmental monitoring (PMEM) reports in accordance with the 2019 EFSA explanatory note on literature searching[2].

Key elements used for the review question are humans, animals, and/or the environment (= population), Bayer GM soybean products, derived food/feed products and respective introduced traits (= intervention/exposure), conventional counterpart or non-GM soybean (= comparator), and adverse effect on human and animal health, and the environment (= outcomes). Accordingly, the eligibility criteria for assessing the relevance of publications for inclusion in the literature review are provided in **Table 1** .

[3] Hereafter referred to as Bayer.

Table 1. Eligibility/inclusion criteria to establish the relevance of publications

Key elements	Criteria
Population	Humans, animals and the environment (taking into account the scope of the applications) *i.e.* authorisation for all uses as any other soybean but excluding the cultivation of Bayer GM soybean products are addressed as general protection goals.
Intervention/exposure	Bayer GM soybean products derived food/feed products and corresponding introduced traits addressed in the publication are identical or similar to those under scientific review by the EFSA.
Comparator	In case of a comparative study that uses the GM plant material as test material, eligible publications must report a non-GM soybean as a comparator.
Outcomes	Adverse effects on human and animal health and the environment are addressed (taking into consideration the scope of the applications).
Additional key elements	
Stacked events	The single events addressed in the publication are the single events in stacked Bayer GM soybean products. Stacked Bayer GM soybean products are addressed in the study.
Information/ data requirements, including source of publications data	The publication potentially contributes to the knowledge of the risk assessment of Bayer GM soybean products for all uses as any other soybean but excluding cultivation. Original/primary data are presented in the publication.

The eligibility/inclusion criteria implemented by Bayer for assessing the relevance of publications follow the recommendations described in the 2019 EFSA explanatory note on literature searching[2]. Following a conservative approach, Bayer selected the broad inclusion/eligibility criteria that align with the review question and the scope of the Bayer GM soybean products' authorisations. Hence, given the conservative approach taken when selecting the eligibility/inclusion criteria, conducting a pilot study was considered unwarranted.

When necessary, the eligibility criteria and/or process may be modified/reviewed as a result of for example new regulatory guidance or novel topics on literature regarding the risk assessment of GM plants.

3. SEARCHING FOR/ IDENTIFYING RELEVANT PUBLICATIONS

In accordance with the 2010 EFSA Guidance on application of systematic review methodology to food and feed safety assessments to support decision making [4] and the 2019 EFSA explanatory note on literature searching[2], identification of bibliographic sources and development of search strategies were developed together with an information specialist who subsequently performed the literature search. The approach used to develop the search strategy follows a lumping method and includes a wide range of free-text terms and, where available, controlled vocabulary that defines search terms.

3.1. Sources of scientific literature

3.1.1. Electronic bibliographic databases

Bayer selects the SciSearch (Science Citation Index)[5] and the CABA[6] (CAB Abstracts®)[7] databases to perform the literature search based on the coverage and relevance of the journals included in these databases. The literature search was conducted using the STN® database catalogue[8].

The SciSearch, produced by from Clarivate Analytics (UK) Limited, includes over 45 million records in Science and technology published since 1974. It includes literatures captured under Science Citation Index Expanded™, a largest multidisciplinary scientific database and an international index covering all scientific topics. It contains also all the records published from the Current Contents series of publications as well as bibliographic information and cited references from over 5 600 scientific, technical and medical journals. In addition, "*Records from January 1991 on include abstracts, author keywords, and KeyWords Plus®. Bibliographic information, authors, cited references, and KeyWords Plus® are searchable*"[5]. The database is updated on a weekly basis.

The CABA, produced by CAB international (UK), includes over 8.9 million records in agriculture and life sciences published since 1973. The database "*covers worldwide literature from all areas of agriculture and related sciences including biotechnology, forestry, and veterinary medicine. Sources for CABA include journals, books, reports, published theses, conference proceedings, and patents. Bibliographic information, indexing terms, abstracts, and CAS Registry Numbers are searchable. An online thesaurus is available for the Con-trolled Term (/CT), the Geographic term (/GT), and the Organism (/ORGN) fields*"[6]. The database is updated on a weekly basis.

All journals included in the two databases must go through a verification process and as a minimum requirement, non-English language journals must include English-language bibliographic information (title, abstract, keywords) and be peer-reviewed[7,9]. In general, English is considered the universal language of science. For this reason, the journals most important to the international research community will publish either full text or a

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4 EFSA, 2010. Application of systematic review methodology to food and feed safety assessments to support decision making The EFSA Journal, 1637, 1-90 - Accessed on 18 September 2023

5 STN/SciSearch: https://www.stn-international.com/sites/default/files/stn/dbss/SCISEARCH.pdf - Accessed 18 September 2023

6 STN/CABA: https://www.stn-international.com/sites/default/files/stn/dbss/CABA.pdf – Accessed on 18 September 2023

7 CAB Abstracts®: https://www.cabi.org/publishing-products/online-information-resources/cab-abstracts/ - Accessed on 18 September 2023

8 STN®: http://stn-international.de/sites/default/files/STN/brochures/stnfile-kat.pdf- Accessed on 18 September 2023

9 Web of Science group; https://clarivate.com/webofsciencegroup/solutions/webofscience-core-collection-editorial-selection-process/ - Accessed on 18 September 2023

minimum of bibliographic information in English, which is especially true in the scientific domain of natural sciences. Full text in English is highly desirable if the journal intends to serve an international community of researchers. Therefore, it is expected that even if there is a relevant article for the food and feed safety of GM plants in a language different than English, the article will include title/abstract/keywords in English, which will guarantee the retrievability of these articles when using keywords and keyword combinations in English.

Based on the above, the selected databases are, to our knowledge, comprehensive, multidisciplinary, conservative sources for literature searching and offer the broadest coverage to retrieve a largest breadth of possible relevant publications. Therefore, additional search sources are not deemed necessary.

3.1.2. Internet (world-wide-web) pages of relevant key organisations

In accordance with the 2019 Explanatory note on literature searching for GMO applications[2], the search in electronic bibliographic databases has been complemented with internet search in webpages of relevant key organisations involved in the risk assessment of GM plants.

Of the 14 key organisations cited in the 2019 Explanatory note on literature searching for GMO applications[2], nine[10] are involved in risk assessment of Bayer GM soybean products. Three of the remaining five (CIBIOGEM, Environment and Climate Change Canada and OECD) are not involved in GM risk assessment while the other two (OGTR and GEAC), for the time being, only assess GM cotton and oilseed rape. Therefore, the internet search focused on the nine key organisations relevant for Bayer GM soybean products.

3.2. Search strategy (electronic databases)

3.2.1. Search terms and search strings

The intervention/exposure key elements were defined and translated into search terms. These search terms were identified following the below listed approaches in line with the 2019 EFSA explanatory note on literature searching[2]:

- assessing words in reference publications,
- assessing subject indexing terms,
- searching for synonyms and related terms and
- consulting experts and stakeholders.

Following the aforementioned approaches, possible synonyms, related terms, abbreviations including acronyms and truncations, old and new as well as lay and scientific terminologies, brand and generic names, and spelling variants including common typos of the search terms were considered. Where applicable, the search was also adapted to controlled vocabulary

[10] Internet pages of the relevant key organisations for Bayer GM soybean products:
US EPA (https://www.epa.gov/environmental-topics/science-topics) - Accessed on 18 September 2023;
USDA (https://www.usda.gov/media) - Accessed on 18 September 2023;
US FDA (https://www.fda.gov/) - Accessed on 18 September 2023;
CFIA (http://www.inspection.gc.ca/eng/1297964599443/1297965645317) - Accessed on v;
Health Canada (https://www.canada.ca/en/health-canada.html) - Accessed on 18 September 2023;
FSANZ (http://www.foodstandards.gov.au/Pages/default.aspx) - Accessed on 18 September 2023;
CTNBio (http://ctnbio.mctic.gov.br/) - Accessed on 18 September 2023;
CONABIA (https://www.argentina.gob.ar/) - Accessed on 18 September 2023;
Japan MAFF (http://www.maff.go.jp/e/) - Accessed on 18 September 2023.

(subject indexing). The search terms were designed to give an excellent coverage and retrieve the broadest possible number of articles related to Bayer GM soybean products.

The translation of the intervention key elements into search terms are presented in **Annex I**. The search terms, the fields and the Boolean operators used to combine them were defined as shown in **Annex II**. The search strings were built following the STN® commands[11] to allow the literature search in the STN® database catalogue. The free-text search terms, controlled vocabulary and the search strings are updated upon identification of a new search term.

The search sets belonging to each key element as described in **Annex I** and **Annex II** were combined by 'OR' to retrieve all the identified publications excluding duplicates. The separate assessment of these search sets, including those yielding only a small number of publications, was considered not necessary as this would duplicate the literature screening process and alter the consistency and comprehensiveness used in the literature search strategies.

3.2.2. Limits applied

An advanced literature search was conducted using the web-based STN® database catalogue for both the selected electronic databases (*see* section 3.1.1). STN® enables searching in each electronic database by making use of pre-defined fields, set combinations based on Boolean operators or a combination of both[12]. In STN®, the results of the search from each database can be merged and duplicates can be removed by de-duplication.

The STN® literature search utilised "Basic Index" (None (or /BI)) field which utilises free-text search terms and enables comprehensive searching in different sections (*e.g.* title, abstract, keywords, supplementary terms, controlled terms) within a record[5,6,11]. Where applicable, controlled vocabulary (subject indexes) offered by CABA (controlled terms (CT)) were also included in the search strategy. Controlled vocabulary is assigned by subject specialists to CAB records to represent the content of the source documents. It allows users to use only one term to search for a concept rather than using lots of terms[13]. The most relevant, broad and controlled terms in the hierarchy of CAB Thesaurus terms and that were listed as preferred terms by CAB for a search query were selected and added to the search string, as shown in **Annex I** and **Annex II**.

3.2.3. Language

The search terms and their combinations are established in English. Therefore, the search is expected to result in a list of titles, abstracts or keywords written in English, covering also articles written in other languages with at least a title, abstract or keywords in English. Also, as technical terms on proteins names, event codes, trade names and Latin names are common in all languages, the search is expected to retrieve articles in all languages.

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[11] STN. Command summary chart for bibliographic and full-text databases. – Accessed on 18 September 2023

[12] STNindex user guide: https://stn.products.fiz-karlsruhe.de/training-center/documentation/stn-index-user-guide - Accessed on 18 September 2023

[13] CAB Direct advanced searching of CAB abstracts: https://www.cabi.org/Uploads/CABI/publishing/training-materials/resources-by-interface/cab-direct-user-guides/advanced-searching-cab-abstracts.pdf - Accessed on 18 September 2023

3.2.4. Time period

The literature searches covered the time span 1 June 2022 - 31 May 2023.

The literature search in the electronic databases was conducted on a quarterly basis considering the entry dates in the STN® database catalogue. **Table 2** shows the search dates and the time span of each search.

Table 2. Description of literature search periods in the electronic databases

Date of the search	Last database update dates	Search period
10 October 2022	SciSearch: 03 October 2022	06 June 2022 – : 03 October 2022
	CABA: 04 October 2022	06 June 2022 – : 03 October 2022
01 February 2023	SciSearch: 01 February 2023	03 October 2022 – 30 January 2023
	CABA: 31 January 2023	03 October 2022 – 30 January 2023
06 June 2023[14]	SciSearch: 06 June 2023	06 June 2022 - 06 June 2023
	CABA: 30 May 2023	06 June 2022 - 06 June 2023

3.2.5. Reference publications

In accordance with the 2019 EFSA explanatory note on literature searching[2], a list of reference publications is provided in **Annex III**. The reference publications were tested and retrieved using the search terms and strategy developed for Bayer GM soybean products.

3.3. Search strategy (relevant key organisations)

All records related to GMO applications and approvals published in the webpage of each relevant key organisation were screened based on 'limits applied' as described in the **Annex IV** and assessed for their relevance to Bayer GM soybean products.

The literature search in the internet pages of the relevant key organisations was conducted on 16 August 2023 and covered the time span 01 June 2022 – 16 August 2023.

4. SELECTING PUBLICATIONS

Publications retrieved from the literature search were screened for their relevance first and then the selected ones were evaluated for their reliability through detailed assessments. Relevance to the search scope and scientific reliability were rigorously assessed by internal and external technical experts.

4.1. Eligibility screening process

The process of selecting relevant publications was undertaken in two stages:

- ***Rapid assessment*** for the relevance based on information in the title and abstract of the publications, to exclude publications that are obviously irrelevant.
- ***Detailed assessment*** of full-text document if required. Full-text documents were obtained for those publications not excluded in the rapid assessment and those documents were assessed in detail for their relevance to the review question. Publications not excluded by the detailed assessment were classified as relevant. At

[14] Note the search was revised on 06 June 2023 as the search scripts were modified to address some errors.

this stage, publications must comply with all the eligibility/inclusion criteria and meet all key elements of the review question.

Experts with a solid experience in GM plants risk assessment performed the screening process. Based on the available comprehensive weight of evidence, the experts assessed if the conclusions of the risk assessment are still valid.

4.2. Reviewers

4.2.1. Number of reviewers

All publications that were identified by the search described in **Section 3** have been screened by three different reviewers (one internal and two external experts) with solid experience in the risk assessment of GM plants.

4.2.2. Expertise of reviewers

Besides their academic background, the reviewers have adequate expertise in the risk assessment areas of GM crops (molecular characterisation, food and feed safety, environmental safety) and several years of experience in the analysis and selection of relevant publications in literature searches for GM applications.

4.2.3. Inter-reviewer agreement

Reviewers (internal and external) perform their assessment in an independent sequential manner. They are in communication and meet on a regular basis to ensure consistent interpretation and implementation of eligibility/inclusion criteria and/or screening process. During the rapid assessment stage, retrieved abstracts and titles of publications are screened by each reviewer independently and assessed against each other to conclude on inclusion or exclusion based on eligibility/inclusion criteria. If opinions on relevance differ, the discrepancies are discussed between the reviewers and if a disagreement persists, the publication under discussion is *de facto* included in the next stage for further consideration. In summary, publications which appear to be relevant and those of unclear relevance, are progressed to the next stage.

During the detailed assessment, the selected publications are assessed in detail, independently and sequentially by the two external reviewers based on the full text of the publications. The publications screened by each reviewer are assessed against each other to conclude on inclusion or exclusion based on eligibility/inclusion criteria. If opinions on relevance differ between reviewers, all reviewers (external and internal) discuss the discrepancy as necessary and, if needed, consult additional internal reviewers to resolve the discrepancy.

If uncertainty remains, the publication is *de facto* reported as unclear providing a justification as suggested by the reviewers. In summary, publications, which appear to be relevant and those of unclear relevance, are reported.

This approach ensures a high-quality process as it allows a harmonised continuous publication screening process across different GM applications in accordance with the 2019 EFSA explanatory note on literature searching[2] and avoids missing publications due to bias towards certain eligibility criteria.

4.3. Classification of publications

Taking account of i) the review question, ii) the scope of the application, *i.e.* authorisation of Bayer GM soybean products for all uses as any other soybean but excluding cultivation in the EU and iii) the eligibility criteria to establish the relevance of retrieved publications, the list of retrieved hits were assessed to conclude whether a certain publication was considered relevant or not. When a publication was considered relevant, the category the publication belongs to is indicated. The following is a non-exhaustive list of categories publications may belong to:

Food/Feed safety assessment

- Molecular characterisation
- Protein expression
- Crop composition
- Agronomic and phenotypic characteristics
- Toxicology - Animal feeding / *In vitro*
- Allergenicity of the protein or the whole food/feed
- Nutrition
- Protein / DNA/ RNA fate in digestive tract

Environmental safety assessment

- Spillage and consequences thereof

It should be noted that the selection criteria are well defined and reassessed annually.

4.4. Quality appraisal of the relevant publications

The relevant publications, if identified, are appraised in terms of reliability in accordance with the 2019 EFSA explanatory note on literature searching[2] by at least two individuals with technical expertise on the topic using the following steps categorised in two main areas:

Credibility of the publication

1. ***Does the publication include sufficient information to establish the reliability of the research?*** Publications with insufficient information (e.g., incomplete experimental design, publications for which only an abstract is publicly available) are categorised as "**not assignable**". Others go to step 2.
2. ***Is the publication scientifically sound/reliable?*** Publications that do not contain scientifically sound/reliable information (e.g., inadequate methodology, test/control materials) are categorised as "**not reliable**". Others go to step 3.

Appropriateness of the publication for the EFSA risk assessment

3. ***What is the relevance level of the publication for the EFSA risk assessment?*** Publications with low relevance for the EFSA risk assessment (e.g. publications dealing with wild relatives or pests not found in the EU) are categorised as "**low reliable**". Publications with moderate relevance for the EFSA risk assessment (e.g., exploratory studies, research with limited focus on risk assessment) are categorised as "**moderately reliable**". Whereas publications with high relevance for the EFSA risk assessment (e.g.

research based on data collected for regulatory studies) are categorised as "**highly reliable**".

In cases of disagreements, the evaluators discuss together and collectively determine the reliability of the publication.

5. SUMMARISING AND REPORTING THE DATA, AND CONSIDERING THE IMPLICATIONS OF THE FINDINGS

5.1. Search outcomes

5.1.1. Outcomes of literature search (electronic databases)

The literature searches identified 211 and 213 hits in SciSearch and CABA databases, respectively (see **Annex II**). After de-duplication[15], the total number resulted in 381 hits (*see* **Annex V)**.

5.1.2. Outcomes of literature search (relevant key organisations)

The literature search in the internet pages of the nine relevant key organisations retrieved a total of 80 records. The links to the results of the literature search and the summary of the retrieved data are shown in **Annex IV**.

5.2. Results of the publication selection process

5.2.1. Results of the publication selection process (electronic databases)

The results of the publication selection process for the retrieved hits from the electronic databases are provided in **Annex V**. Two relevant publications were retrieved after detailed assessment of the full text documents.

For bibliographic details regarding these publications in .RIS format, see **Annex VI**.

For the full-text documents of the relevant publications, see the references folder within the Appendix 3_Literature search folder.

5.2.2. Results of the publication selection process (relevant key organisations)

The results of the publication selection process for the retrieved records from the relevant key organisations are provided in **Annex IV**. Three records were identified as relevant. For the full-text documents of the relevant publications, see **Annex IV**.

5.3. Considering the implications of the findings

The reliability assessment for the relevant publications is provided in **Annex V.** The three relevant records retrieved from the relevant key organisations (see **Annex IV**) are reliable since the rationale for the positive conclusions in those records are consistent with the results reported in the data package provided by Bayer. All the relevant publications have no implications for the risk assessment of Bayer GM soybean products because no new hazards, modified exposure, or new uncertainties are reported.

[15] Corresponds to the unique publications after STN® and manual de-duplication.

The comprehensive literature search for publications relevant to the food, feed, and environmental safety of Bayer GM soybean products found no new information that would invalidate the conclusions of the risk assessment Bayer GM soybean products.

6. CONCLUSION

Taking into consideration all the above, Bayer confirms that this literature search, conducted in accordance with the 2019 EFSA explanatory note on literature searching[2] to support the general surveillance in the context of 2022/2023 annual PMEM for Bayer GM soybean products, identified no relevant publications that would invalidate the conclusions of the Bayer GM soybean products previous risk assessments. Therefore, the conclusions of the risk assessment as presented in the initial applications of the Bayer GM soybean products remain unchanged.

Annex I. Translation of intervention/exposure key elements into search terms for Bayer GM soybean products literature search in STN® database catalogue

1. Free-text search terms for Bayer GM Soybean products

Key elements	Search terms	Synonyms, related terms, abbreviations/ acronyms/ truncations, lay/ scientific terms, brand/ generic names and spelling variants/ typos (adapted for performing search in STN® database catalogue)
Event names	40-3-2 or MON-Ø4Ø32-6 MON 89788 or MON-89788-1 MON 87769 or MON-87769-7 MON 87701 or MON-877Ø1-2 MON 87705 or MON-877Ø5-6 MON 87708 or MON-877Ø8-9 MON 87751 or MON-87751-7 A5547-127 or ACS-GMØØ6-4	(40!3!2 AND (SOY? OR GLYCINE MAX OR G. MAX)) OR MON 04032? OR MON04032? OR MON O4O32? OR MONO4O32? OR MON EMPTY SET4EMPTY SET32? OR MONEMPTY SET4EMPTY SET32? OR MON!04032? OR MON!O4O32? OR MON!EMPTY SET4EMPTY SET32? MON 89788? OR MON89788? OR MON!89788? OR MON 87769? OR MON87769? OR MON!87769? MON 87701? OR MON87701? OR MON 877O1? OR MON877O1? OR MON 877EMPTY SET1? OR MON877EMPTY SET1? OR MON!87701? OR MON!877O1? OR MON!877EMPTY SET1? MON 87705? OR MON87705? OR MON 877O5? OR MON877O5? OR MON 877EMPTY SET5? OR MON877EMPTY SET5? OR MON!87705? OR MON!877O5? OR MON!877EMPTY SET5? MON 87708? OR MON87708? OR MON 877O8? OR MON877O8? OR MON 877EMPTY SET8? OR MON877EMPTY SET8? OR MON!87708? OR MON!877O8? OR MON!877EMPTY SET8? MON 87751? OR MON87751? OR MON!87751? ((A5547!127 OR A5547 127) AND (SOY? OR GLYCINE MAX OR G. MAX)) OR ACS!GM006? OR ACS!GMOO6? OR ACS!GMEMPTY SETEMPTY SET6? OR ACS GM006? OR ACS GMOO6? OR ACS GMEMPTY SETEMPTY SET6?
Trade names	Roundup Ready® soybean Roundup Ready 2 Yield® soybean	ROUNDUPREADY? OR ROUND!UP!READY? OR ROUND!UP READY? OR ROUNDUP READY? OR ROUND UP READY? OR RR2Y? OR RRIIY? OR INTACTA OR RR2 PRO? OR RRII PRO? OR

	Vistive Gold™ soybean Intacta RR2 Pro® soybean Roundup Ready 2 Xtend® soybean Intacta 2 Xtend™ XtendFlex™ Soybean	VISTIVE? OR VISTIVE? GOLD? OR XTEND? OR XTENDFLEX? OR XTEND FLEX?
Newly expressed proteins	CP4 EPSPS DMO PAT Cry1Ac Cry1A.105 Cry2Ab2 Primula juliae Δ6 desaturase (Pj.D6D) and Neurospora crassa Δ15 desaturase (Nc.Fad3)	CP4EPSPS? OR CP4 EPSPS? OR 5(W)(ENOL PYRUVYL SHIKIMATE OR ENOLPYRUVYL SHIKIMATE OR ENOL PYRUVYLSHIKIMATE OR ENOL!PYRUVYL! SHIKIMATE! OR ENOLPYRUVYLSHIKIMATE)(W)3 PHOSPHATE(1W)SYNTHASE OR DICAMBA ?OXYGENASE OR DICAMBA ?DEMETHYLASE OR (DMO? AND (GENE OR ENZYME OR PROTEIN)) OR (PAT AND (GENE OR ENZYME OR PROTEIN)) OR (PHOSPHINOTHRICIN AND (ACETYL TRANSFERASE OR ACETYL!TRANSFERASE OR ACETYLTRANSFERASE)) OR CRY1AC OR CRYIAC OR CRY1 AC OR CRY 1 AC OR CRY 1AC OR CRYI AC OR CRY I AC OR CRY IAC OR OR CRY1A105 OR CRY1A 105 OR CRY 1A 105 OR CRY 1A105 OR CRYIA105 OR CRYIA 105 OR CRY IA 105 OR CRY IA105 OR CRY1A.105 OR CRY2AB? OR CRY2 AB? OR CRY 2 AB? OR CRY 2AB? OR CRYIIAB? OR CRYII AB? OR CRY II AB? OR CRY IIAB? OR OR PJ!D6D OR PJD6D OR PJ D6D OR NC!FAD3 OR NCFAD3 OR NC FAD3 OR NC!FAD 3 OR NCFAD 3 OR NC FAD 3 OR DESATURASE?
Newly expressed RNAs	FATB1-A and FAD2-1A gene segments	(RNA? OR DSRNA? OR SIRNA?)(5A) (FAT! B? OR FAD!2? OR FAT B? OR FAD 2? OR FADB? OR FAD2? OR THIOESTERASE? OR DESATURASE?)
Intended traits: Herbicide tolerance traits	Glyphosate/roundup tolerance Dicamba tolerance Glufosinate tolerance	(TOLERAN? OR RESISTAN? OR PROTEC?)(5A) (GL!PHOSATE OR GL!FOSATE OR ROUNDUP? OR ROUND!UP? OR ROUND UP? OR DICAMBA OR ?METHOXYBENZOIC ACID

		OR GLUFOSINATE OR GLUPHOSINATE OR BASTA OR IGNITE OR LIBERTY OR PHOSPHINOTHRICIN OR ?BUTANOIC ACID)
Intended traits: Insect protection traits	Bt soy (soybean)/ *Bacillus thuringiensis* soybean providing Lepidopteran protection or protection against soybean looper (SBL) or Sunflower looper (SFL) or Black armyworm or corn earworm (CEW) or cotton bollworm (CBW) or soybean podworm or old world bollworm or african bollworm or american bollworm or cotton bollworm or corn earworm (CEW) or sunflower looper or soybean anxil borer or soybean budborer or *Anticarsia gemmatalis* or *Chrysodeixis includens* or *Pseudoplusia includens* or *Rachiplusia nu* or *Spodoptera frugipeda* or *Helicoverpa zea* or *Helicoverpa armigera Crocidosema aporema* or *Epinotia aporema*	(BT SOY? OR BTSOY? OR BT!SOY? OR THURINGIENSIS SOY? OR THURINGIENSISSOY? OR THURINGIENSIS!SOY?) (TOLERAN? OR RESISTAN? OR PROTEC?)(5A)(CATERPILLAR? OR LOOPER? OR BORER? OR BUDBORER? OR LEPIDOPTERA? OR EREBIDAE OR NOCTUIDAE OR TORTRICIDAE OR ANTICARSIA OR GEMMATALIS OR CHRYSODEIXIS OR PSEUDOPLUSIA) OR INCLUDENS OR EPINOTIA OR CROCIDOSEMA OR APOREMA OR RACHIPLUSIA OR R. NU OR CHLORIDEA OR VIRESCENS OR VBC OR SBL OR SFL OR ARMYWORM? OR ARMY WORM? OR EARWORM? OR EAR WORM? OR BOLLWORM? OR BOLL WORM? OR PODWORM? OR POD WORM? OR SPODOPTERA OR COSMIOIDES OR FRUGIPERDA OR HELICOVERPA OR ZEA OR ARMIGERA OR FAW OR CEW OR CBW)
Intended traits: improved fatty acid profile	Expression of stearidonic acid (SDA; 18:4) Improved fatty acid profile (high monounsaturated fatty acids and low saturated and polyunsaturated fatty acids)	STEARIDONIC ACID OR SDA OR (HIGH? OR INCRE? OR CHANG?)(5A)(OLEIC OR MONOUNSATURATED OR MONO!UNSATURATED OR MONO UNSATURATED OR MUFA OR FAT?) (LOW? OR DECRE? OR REDUC?)(5A)(SATURATED OR PALMITIC OR STEARIC OR LINOLEIC OR POLYUNSATURATED OR POLY!UNSATURATED OR POLY UNSATURATED OR PUFA)
Crop name	Soybean, Soy, *Glycine max*	SOYBEAN? OR SOY? OR GLYCINE MAX OR G. MAX OR SOY BEAN
GMO general terms	Genetically modified organism (GMO, GM); Living modified organism (LMO); biotechnology-derived organism (biotech-derived); Genetic engineering (GE); transgenesis (transgene); genetic transformation; genetic manipulation; genetic improvement.	GMO? OR LMO? OR GM OR GE OR TRANSGEN? OR ((GENETIC? OR LIVING OR BIOTECH?)(5A)(MODIF? OR TRANSFORM? OR MANIPULAT? OR IMPROV? OR ENGINEER? OR DERIV?))

2. Controlled vocabulary, if applicable. Bayer GM Soybean products

Key elements	Search terms	Controlled terms offered by CABA (adapted for performing search in STN® database catalogue)
Event name	Not applicable	
Trade name	Not applicable	
Newly expressed proteins	Not applicable	
Intended traits : Insect protection and herbicide tolerance traits	Bt soy (soybean)/ *Bacillus thuringiensis* soybean providing Lepidopteran protection or protection against soybean looper (SBL) or Sunflower looper (SFL) or Black armyworm or corn earworm (CEW) or cotton bollworm (CBW) or soybean podworm or old world bollworm or 18merica bollworm or 18merican bollworm or cotton bollworm or corn earworm (CEW) or sunflower looper or soybean anxil borer or soybean budborer or *Anticarsia gemmatalis* or *Chrysodeixis includens* or *Pseudoplusia includens* or *Rachiplusia nu* or *Spodoptera frugipeda* or *Helicoverpa zea* or *Helicoverpa armigera* *Crocidosema aporema* or *Epinotia aporema* Glyphosate/roundup tolerance Dicamba tolerance Glufosinate tolerance	WEED CONTROL+UF,NT/CT OR INSECT CONTROL+UF,NT/CT) AND (GLYPHOSATE+UF,NT/CT OR DICAMBA+UF,NT/CT OR GLUFOSINATE+UF,NT/CT OR LEPIDOPTERA+UF,NT2/CT,ORGN OR EREBIDAE+UF/CT,ORGN OR NOCTUIDAE+UF/CT,ORGN OR TORTRICIDAE+UF/CT,ORGN OR ANTICARSIA+UF,NT1/CT,ORGN OR CHRYSODEIXIS+UF,NT1/CT,ORGN) (PSEUDOPLUSIA+UF,NT1/CT,ORGN OR CHLORIDEA+UF,NT1/CT,ORGN OR CROCIDOSEMA+UF,NT1/CT,ORGN OR EPINOTIA+UF,NT1/CT,ORGN OR RACHIPLUSIA+UF,NT1/CT,ORGN)
Intended traits: Improved fatty acid profile	Improved fatty acid profile	SATURATED FATTY ACIDS+UF,NT/CT OR UNSATURATED FATTY ACIDS+UF,NT/CT
Crop name	Soybean, Soy, *Glycine max*	SOYABEANS+UF,NT/CT,ORGN

GMO general terms	Genetically modified organism (GMO, GM); Living modified organism (LMO); biotechnology-derived organism (biotech-derived); Genetic engineering (GE); transgenesis (transgene); genetic transformation; genetic manipulation; genetic improvement	GENETIC ENGINEERING+UF,NT/CT OR GENETIC TRANSFORMATION+UF,NT/CT OR GENETICALLY ENGINEERED FOODS+UF,NT/CT OR GENETICALLY ENGINEERED ORGANISMS+UF,NT/CT OR FOOD BIOTECHNOLOGY+UF,NT/CT

Annex II. The search string used for Bayer GM [CROP NAME] products literature search in SciSearch and CABA databases using STN® database catalogue, and outcomes of the search (2022-2023)

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This alert run covers the time range from 20220606 until 20230606


This alert will only include literature published from 2022 onwards

d his full


     (FILE 'STNGUIDE' ENTERED AT 14:53:54 ON 06 JUN 2023)
                DEL HIS Y
L1              QUE SPE=ON  ABB=ON  PLU=ON  (40!3!2 AND (SOY? OR GLYCINE MAX
                OR G. MAX)) OR MON 04032? OR MON04032? OR MON O4O32? OR
                MONO4O32? OR MON EMPTY SET4EMPTY SET32? OR MONEMPTY SET4EMPTY
                SET32? OR MON!04032? OR MON!O4O32? OR MON!EMPTY SET4EMPTY
                SET32?
L2              QUE SPE=ON  ABB=ON  PLU=ON  MON 89788? OR MON89788? OR
                MON!89788? OR MON 87769? OR MON87769? OR MON!87769?
L3              QUE SPE=ON  ABB=ON  PLU=ON  MON 87701? OR MON87701? OR MON
                877O1? OR MON877O1? OR MON 877EMPTY SET1? OR MON877EMPTY SET1?
                OR MON!87701? OR MON!877O1? OR MON!877EMPTY SET1?
L4              QUE SPE=ON  ABB=ON  PLU=ON  MON 87705? OR MON87705? OR MON
                877O5? OR MON877O5? OR MON 877EMPTY SET5? OR MON877EMPTY SET5?
                OR MON!87705? OR MON!877O5? OR MON!877EMPTY SET5?
L5              QUE SPE=ON  ABB=ON  PLU=ON  MON 87708? OR MON87708? OR MON
                877O8? OR MON877O8? OR MON 877EMPTY SET8? OR MON877EMPTY SET8?
                OR MON!87708? OR MON!877O8? OR MON!877EMPTY SET8?
L6              QUE SPE=ON  ABB=ON  PLU=ON  MON 87751? OR MON87751? OR
                MON!87751?
L7              QUE SPE=ON  ABB=ON  PLU=ON  ((A5547 127 OR A5547!127) AND
                (SOY? OR GLYCINE MAX OR G. MAX)) OR ACS!GM006? OR ACS!GMOO6?
                OR ACS!GMEMPTY SETEMPTY SET6? OR ACS GM006? OR ACS GMOO6? OR
                ACS GMEMPTY SETEMPTY SET6?
L8              QUE SPE=ON  ABB=ON  PLU=ON  ROUNDUPREADY? OR ROUND!UP!READY?
                OR ROUND!UP READY? OR ROUNDUP READY? OR ROUND UP READY? OR
                RR2Y? OR RRIIY? OR INTACTA OR RR2 PRO? OR RRII PRO? OR
                VISTIVE? OR VISTIVE? GOLD? OR XTEND? OR XTENDFLEX? OR XTEND
                FLEX?
L9              QUE SPE=ON  ABB=ON  PLU=ON  SOYBEAN? OR SOY? OR GLYCINE MAX OR
                G. MAX OR SOY BEAN
L10             QUE SPE=ON  ABB=ON  PLU=ON  CP4EPSPS? OR CP4 EPSPS? OR
                5(W)(ENOL PYRUVYL SHIKIMATE OR ENOLPYRUVYL SHIKIMATE OR ENOL
                PYRUVYLSHIKIMATE OR ENOL!PYRUVYL!SHIKIMATE OR ENOLPYRUVYLSHIKIM
                ATE)(W)3 PHOSPHATE(1W)SYNTHASE
L11             QUE SPE=ON  ABB=ON  PLU=ON  DICAMBA ?OXYGENASE OR DICAMBA
                ?DEMETHYLASE OR (DMO? AND (GENE OR ENZYME OR PROTEIN)) OR (PAT
                AND (GENE OR ENZYME OR PROTEIN)) OR (PHOSPHINOTHRICIN AND
                (ACETYL TRANSFERASE OR ACETYL!TRANSFERASE OR ACETYLTRANSFERASE
                ))
L12             QUE SPE=ON  ABB=ON  PLU=ON  CRY1AC OR CRYIAC OR CRY1 AC OR CRY
                1 AC OR CRY 1AC OR CRYI AC OR CRY I AC OR CRY IAC OR CRY1A105
                OR CRY1A 105 OR CRY 1A 105 OR CRY 1A105 OR CRYIA105 OR CRYIA
                105 OR CRY IA 105 OR CRY IA105 OR CRY1A.105
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L13             QUE SPE=ON  ABB=ON  PLU=ON  CRY2AB? OR CRY2 AB? OR CRY 2 AB?
                OR CRY 2AB? OR CRYIIAB? OR CRYII AB? OR CRY II AB? OR CRY
                IIAB?
L14             QUE SPE=ON  ABB=ON  PLU=ON  PJ!D6D OR PJD6D OR PJ D6D OR
                NC!FAD3 OR NCFAD3 OR NC FAD3 OR NC!FAD 3 OR NCFAD 3 OR NC FAD
                3 OR DESATURASE?
L15             QUE SPE=ON  ABB=ON  PLU=ON  (RNA? OR DSRNA? OR SIRNA?)(5A)(FAT!
                B? OR FAD!2? OR FAT B? OR FAD 2? OR FADB? OR FAD2? OR THIOESTER
                ASE? OR DESATURASE?)
L16             QUE SPE=ON  ABB=ON  PLU=ON  GMO? OR LMO? OR GM OR GE OR
                TRANSGEN? OR ((GENETIC? OR LIVING OR BIOTECH?)(5A)(MODIF? OR
                TRANSFORM? OR MANIPULAT? OR IMPROV? OR ENGINEER? OR DERIV?))
L17             QUE SPE=ON  ABB=ON  PLU=ON  (TOLERAN? OR RESISTAN? OR PROTEC?)(
                5A)(GL!PHOSATE OR GL!FOSATE OR ROUNDUP? OR ROUND!UP? OR ROUND
                UP? OR DICAMBA OR ?METHOXYBENZOIC ACID OR GLUFOSINATE OR
                GLUPHOSINATE OR BASTA OR IGNITE OR LIBERTY OR PHOSPHINOTHRICIN
                OR ?BUTANOIC ACID)
L18             QUE SPE=ON  ABB=ON  PLU=ON  (TOLERAN? OR RESISTAN? OR PROTEC?)(
                5A)(CATERPILLAR? OR LOOPER? OR BORER? OR BUDBORER? OR LEPIDOPTE
                RA? OR EREBIDAE OR NOCTUIDAE OR TORTRICIDAE OR ANTICARSIA OR
                GEMMATALIS OR CHRYSODEIXIS OR PSEUDOPLUSIA)
L19             QUE SPE=ON  ABB=ON  PLU=ON  (TOLERAN? OR RESISTAN? OR PROTEC?)(
                5A)(INCLUDENS OR EPINOTIA OR CROCIDOSEMA OR APOREMA OR
                RACHIPLUSIA OR R. NU OR CHLORIDEA OR VIRESCENS OR VBC OR SBL
                OR SFL OR ARMYWORM? OR ARMY WORM? OR EARWORM? OR EAR WORM?)
L20             QUE SPE=ON  ABB=ON  PLU=ON  (TOLERAN? OR RESISTAN? OR PROTEC?)(
                5A)(BOLLWORM? OR BOLL WORM? OR PODWORM? OR POD WORM? OR
                SPODOPTERA OR COSMIOIDES OR FRUGIPERDA OR HELICOVERPA OR ZEA
                OR ARMIGERA OR FAW OR CEW OR CBW)
L21             QUE SPE=ON  ABB=ON  PLU=ON  (BT SOY? OR BTSOY? OR BT!SOY? OR
                THURINGIENSIS SOY? OR THURINGIENSISSOY? OR THURINGIENSIS!SOY?)
L22             QUE SPE=ON  ABB=ON  PLU=ON  STEARIDONIC ACID OR SDA OR (HIGH?
                OR INCRE? OR CHANG?)(5A)(OLEIC OR MONOUNSATURATED OR MONO!UNSAT
                URATED OR MONO UNSATURATED OR MUFA OR FAT?)
L23             QUE SPE=ON  ABB=ON  PLU=ON  (LOW? OR DECRE? OR REDUC?)(5A)(SATU
                RATED OR PALMITIC OR STEARIC OR LINOLEIC OR POLYUNSATURATED OR
                POLY!UNSATURATED OR POLY UNSATURATED OR PUFA)
L24             QUE SPE=ON  ABB=ON  PLU=ON  SOYABEANS+UF,NT/CT,ORGN
L25             QUE SPE=ON  ABB=ON  PLU=ON  GENETIC ENGINEERING+UF,NT/CT OR
                GENETIC TRANSFORMATION+UF,NT/CT OR GENETICALLY ENGINEERED
                FOODS+UF,NT/CT OR GENETICALLY ENGINEERED ORGANISMS+UF,NT/CT OR
                FOOD BIOTECHNOLOGY+UF,NT/CT
L26             QUE SPE=ON  ABB=ON  PLU=ON  (WEED CONTROL+UF,NT/CT OR INSECT
                CONTROL+UF,NT/CT)
L27             QUE SPE=ON  ABB=ON  PLU=ON  (GLYPHOSATE+UF,NT/CT OR DICAMBA+UF,
                NT/CT OR GLUFOSINATE+UF,NT/CT OR LEPIDOPTERA+UF/CT,ORGN OR
                EREBIDAE+UF/CT,ORGN OR NOCTUIDAE+UF/CT,ORGN OR TORTRICIDAE+UF/C
                T,ORGN OR ANTICARSIA+UF,NT1/CT,ORGN OR CHRYSODEIXIS+UF,NT1/CT,O
                RGN)
L28             QUE SPE=ON  ABB=ON  PLU=ON  (PSEUDOPLUSIA+UF,NT1/CT,ORGN OR
                CHLORIDEA+UF,NT1/CT,ORGN OR CROCIDOSEMA+UF,NT1/CT,ORGN OR
                EPINOTIA+UF,NT1/CT,ORGN OR RACHIPLUSIA+UF,NT1/CT,ORGN)
L29             QUE SPE=ON  ABB=ON  PLU=ON  SATURATED FATTY ACIDS+UF,NT/CT OR
                UNSATURATED FATTY ACIDS+UF,NT/CT

     FILE 'SCISEARCH' ENTERED AT 14:54:13 ON 06 JUN 2023
L30           9 SEA SPE=ON  ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5 OR L6
                OR L7) AND ED>=20220606 AND ED<=20230606 AND PY>=2022
L31          28 SEA SPE=ON  ABB=ON  PLU=ON  L8 AND ED>=20220606 AND ED<=2023060
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                6 AND PY>=2022
L32          8726 SEA SPE=ON  ABB=ON  PLU=ON  L9 AND ED>=20220606 AND ED<=2023060
                6 AND PY>=2022
L33             9 SEA SPE=ON  ABB=ON  PLU=ON  L31 AND L32
L34           287 SEA SPE=ON  ABB=ON  PLU=ON  (L10 OR L11) AND ED>=20220606 AND
                ED<=20230606 AND PY>=2022
L35            94 SEA SPE=ON  ABB=ON  PLU=ON  (L12 OR L13) AND ED>=20220606 AND
                ED<=20230606 AND PY>=2022
L36           686 SEA SPE=ON  ABB=ON  PLU=ON  L14 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L37            13 SEA SPE=ON  ABB=ON  PLU=ON  L15 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L38          1072 SEA SPE=ON  ABB=ON  PLU=ON  L34 OR L35 OR L36 OR L37
L39         29150 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L40           209 SEA SPE=ON  ABB=ON  PLU=ON  L38 AND (L39 OR L32)
L41           213 SEA SPE=ON  ABB=ON  PLU=ON  L17 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L42           287 SEA SPE=ON  ABB=ON  PLU=ON  (L18 OR L19 OR L20) AND ED>=2022060
                6 AND ED<=20230606 AND PY>=2022
L43             8 SEA SPE=ON  ABB=ON  PLU=ON  L21 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L44         18555 SEA SPE=ON  ABB=ON  PLU=ON  (L22 OR L23) AND ED>=20220606 AND
                ED<=20230606 AND PY>=2022
L45         19048 SEA SPE=ON  ABB=ON  PLU=ON  L41 OR L42 OR L44
L46            42 SEA SPE=ON  ABB=ON  PLU=ON  L45 AND L39 AND L32
L47             6 SEA SPE=ON  ABB=ON  PLU=ON  L43 AND L39
L48            45 SEA SPE=ON  ABB=ON  PLU=ON  L46 OR L47
L49           250 SEA SPE=ON  ABB=ON  PLU=ON  L30 OR L33 OR L40 OR L48

     FILE 'CABA' ENTERED AT 14:54:36 ON 06 JUN 2023
L50             9 SEA SPE=ON  ABB=ON  PLU=ON  (L1 OR L2 OR L3 OR L4 OR L5 OR L6
                OR L7) AND ED>=20220606 AND ED<=20230606 AND PY>=2022
L51            27 SEA SPE=ON  ABB=ON  PLU=ON  L8 AND ED>=20220606 AND ED<=2023060
                6 AND PY>=2022
L52          7145 SEA SPE=ON  ABB=ON  PLU=ON  L9 AND ED>=20220606 AND ED<=2023060
                6 AND PY>=2022
L53          4970 SEA SPE=ON  ABB=ON  PLU=ON  L24 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L54          7145 SEA SPE=ON  ABB=ON  PLU=ON  L52 OR L53
L55            14 SEA SPE=ON  ABB=ON  PLU=ON  L51 AND L54
L56           101 SEA SPE=ON  ABB=ON  PLU=ON  (L10 OR L11) AND ED>=20220606 AND
                ED<=20230606 AND PY>=2022
L57            94 SEA SPE=ON  ABB=ON  PLU=ON  (L12 OR L13) AND ED>=20220606 AND
                ED<=20230606 AND PY>=2022
L58           306 SEA SPE=ON  ABB=ON  PLU=ON  L14 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L59            12 SEA SPE=ON  ABB=ON  PLU=ON  L15 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L60           507 SEA SPE=ON  ABB=ON  PLU=ON  L56 OR L57 OR L58 OR L59
L61         11384 SEA SPE=ON  ABB=ON  PLU=ON  L16 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L62          6177 SEA SPE=ON  ABB=ON  PLU=ON  L25 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L63         12121 SEA SPE=ON  ABB=ON  PLU=ON  L61 OR L62
L64           174 SEA SPE=ON  ABB=ON  PLU=ON  L60 AND (L54 OR L63)
L65           216 SEA SPE=ON  ABB=ON  PLU=ON  L17 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L66           349 SEA SPE=ON  ABB=ON  PLU=ON  (L18 OR L19 OR L20) AND ED>=2022060
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                6 AND ED<=20230606 AND PY>=2022
L67           7 SEA SPE=ON  ABB=ON  PLU=ON  L21 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L68        7851 SEA SPE=ON  ABB=ON  PLU=ON  (L22 OR L23) AND ED>=20220606 AND
                ED<=20230606 AND PY>=2022
L69        3065 SEA SPE=ON  ABB=ON  PLU=ON  L26 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L70        1241 SEA SPE=ON  ABB=ON  PLU=ON  (L27 OR L28) AND ED>=20220606 AND
                ED<=20230606 AND PY>=2022
L71         227 SEA SPE=ON  ABB=ON  PLU=ON  L69 AND L70
L72        5051 SEA SPE=ON  ABB=ON  PLU=ON  L29 AND ED>=20220606 AND ED<=202306
                06 AND PY>=2022
L73        5275 SEA SPE=ON  ABB=ON  PLU=ON  L72 OR L71
L74       11899 SEA SPE=ON  ABB=ON  PLU=ON  L65 OR L66 OR L68 OR L73
L75          23 SEA SPE=ON  ABB=ON  PLU=ON  L70 AND L63 AND L54
L76           7 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND L63
L77          29 SEA SPE=ON  ABB=ON  PLU=ON  L75 OR L76
L78         213 SEA SPE=ON  ABB=ON  PLU=ON  L50 OR L55 OR L64 OR L77

     FILE 'STNGUIDE' ENTERED AT 14:55:36 ON 06 JUN 2023

     FILE 'CABA, SCISEARCH' ENTERED AT 14:55:37 ON 06 JUN 2023
L79          424 DUP REM L78 L49 (39 DUPLICATES REMOVED)
                     ANSWERS '1-213' FROM FILE CABA
                     ANSWERS '214-424' FROM FILE SCISEARCH
                 D L79 1-424 ALL PY


     FILE SCISEARCH

     FILE COVERS 1974 TO 6 Jun 2023 (20230606/ED)

     To bring you the most up-to-date SciSearch information,
     SciSearch SDIs now run on Mondays.

     FILE CABA
     FILE LAST UPDATED: 30 MAY 2023       <20230530/UP>
     FILE COVERS 1973 TO DATE

     <<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE IN
         THE BASIC INDEX (/BI), ABSTRACT (/AB), AND TITLE (/TI) FIELDS  >>>
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Annex III. List of reference publications used in identifying search terms and in validating the literature search strategy for Bayer GM soybean products literature search

The list below includes reference publications used for each relevant key element, namely event name, trade name, newly expressed proteins and intended traits. For GMO general and crop name search terms, given the breadth of the terms and as they are used to focus the search to GM crops, reference publications were considered not applicable.

Berman KH, Harrigan GG, Riordan SG, Nemeth MA, Hanson C, Smith M, Sorbet R, Zhu E, Ridley WP. (2009). Compositions of seed, forage, and processed fractions from insect-protected soybean MON 87701 are equivalent to those of conventional soybean. Journal of Agricultural and Food Chemistry, 57, 11360-11369.

Berman KH, Harrigan GG, Riordan SG, Nemeth MA, Hanson C, Smith M, Sorbet R, Zhu E, Ridley WP. (2010) Compositions of forage and seed from second-generation glyphosate-tolerant soybean MON 89788 and insect-protected soybean MON 87701 from Brazil are equivalent to those of conventional soybean (Glycine max). Journal of Agricultural and Food Chemistry, 58, 6270-6276.

Berman KH, Harrigan GG, Riordan SG, Nemeth MA, Oliveira W, Tagliaferro F and Berger GU, (2011). Compositional equivalence of insect-protected glyphosate-tolerant soybean, MON 87701 x MON 89788, to conventional soybean extends across different world regions and multiple growing seasons. Journal of Agricultural and Food Chemistry, 59, 11643-11651.

Harrigan GG, Ridley WP, Riordan SG, Nemeth MA, Sorbet R, Trujillo WA, Breeze ML, Schneider RW. (2007). Chemical composition of glyphosate-tolerant sobyean 40-3-2 grown in Europe remains equivalent with that of conventional soybean (Glycine max L.). Journal of Agricultural and Food Chemistry, 55, 6160-6168.

Horak MJ, Rosenbaum EW, Kendrick DL, Sammons B, Phillips SL, Nickson TE, Dobert RC, Perez T. (2015) Plant characterization of Roundup Ready 2 Yield® soybean, MON 89788, for use in ecological risk assessment. TRANSGENIC RESEARCH, 24, 213-225

Lundry DR, Ridley WP, Meyer JJ, Riordan SG, Nemeth MA, Trujillo WA, Breeze ML, Sorbet R. (2008) Composition of grain, forage, and processed fractions from second-generation glyphosate-tolerant soybean, MON 89788, is equivalent to that of conventional soybean (Glycine max L.). Journal of Agricultural and Food Chemistry, 56, 4611-4622.

McCann MC, Liu K, Trujillo WA, Dobert RC. (2005). Glyphosate-tolerant soybeans remain compositionally equivalent to conventional soybeans (Glycine max L.) during three years of field testing. Journal of Agricultural and Food Chemistry, 53, 5331-5335.

Taylor NB, Fuchs RL, MacDonald J, Shariff AR, Padgette SR. (1999). Compositional analysis of glyphosate-tolerant soybeans treated with glyphosate. Journal of Agricultural and Food Chemistry, 47, 4469- 4473.

Taylor M, Bickel A, Mannion R, Bell E, Harrigan GG. (2017). Dicamba-tolerant soybeans (Glycine max L.) MON 87708 and MON 87708 × MON 89788 are compositionally equivalent to conventional soybean. Journal of Agricultural and Food Chemistry, 65, 8037−8045.

Vries BD, Fehr WR. (2011) Impact of the MON89788 event for glyphosate tolerance on agronomic and seed traits of soybean. Crop Science, 51, 1023-1027.

Zhou J, Harrigan GG, Berman KH, Webb EG, Klusmeyer TH, Nemeth MA. (2011). Stability in the composition equivalence of grain from insect-protected maize and seed from glyphosate-tolerant soybean to conventional counterparts over multiple seasons, locations, and breeding germplasms. Journal of Agricultural and Food Chemistry, 59, 8822-8828.

Annex IV. Literature search in internet pages of relevant key organisations for Bayer GM soybean products covering time span 2022 - 2023

Relevant key organisations	Link to the relevant information and summary of the retrieved records
US EPA	https://www.epa.gov/ingredients-used-pesticide-products/current-and-previously-registered-section-3-plant-incorporated – Accessed on 16 August 2023. The webpage dedicated to PIP registrations was checked. *Date of the most recent website update at the time of the search*: 14 July 2020 *Limits applied*: The list of PIP active ingredients registered was sorted by 'Year Registered' and those registered starting from 2022 were assessed. *Number of records retrieved matching the abovementioned criteria*: "Zero". *Number of relevant records or full-text documents retrieved*: No record was retrieved.
USDA	https://www.aphis.usda.gov/aphis/ourfocus/biotechnology/regulatory-processes/petitions/petition-status/petitions-table - Accessed on 16 August 2023. The webpage dedicated to petitions for determination of nonregulated status was checked. *Date of the most recent website update at the time of the search*: 21 April 2023 *Limits applied*: The list of the petitions was sorted by 'Effective Date' and those deregulated starting from 01/01/2022 were assessed. *Number of records retrieved matching the abovementioned criteria*: "One". *Number of relevant records or full-text documents retrieved*: The retrieved record is not relevant to Bayer GM soybean products.

US FDA	https://www.accessdata.fda.gov/scripts/fdcc/?set=Biocon – Accessed on 16 August 2023. The webpage dedicated to biotechnology consultations on food from GE plant varieties was checked. *Date of the most recent website update at the time of the search*: 31 July 2023 *Limits applied*: The list of the consultations starting from the 'FDA Letter Date' of 01 01, 2022 was assessed. *Number of records retrieved matching the abovementioned criteria*: "11". *Number of relevant records or full-text documents retrieved*: The retrieved records are not relevant to Bayer GM soybean products.
CFIA	https://inspection.canada.ca/industry-guidance/eng/1374161650885/1374161737236?gp=3&gc=25&ga=4#gdr_results - Accessed on 16 August 2023. The webpage dedicated to repository documents referring to plants with novel traits was checked. *Date of the most recent website update at the time of the search*: not clear *Limits applied*: The list of repository documents referring to plants with novel traits starting from 'Date modified' of 2023-03-01 was assessed. *Number of records retrieved matching the abovementioned criteria*: "30". *Number of relevant records or full-text documents retrieved*: Two of the retrieved records are relevant to MON 87708 and MON 87751[16]. They do not have any implication on the risk assessment, because no new hazards, modified exposure, or new scientific uncertainties are reported.
Health Canada	https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/approved-products.html - Accessed on 16 August 2023. The webpage dedicated to approved products of genetically modified (GM) foods and other novel foods was checked. *Date of the most recent website update at the time of the search*: 11 August 2023 *Limits applied*: The list of novel food decisions starting from the 'Decision Date (20YY/MM/DD)' of 2022/01/01 was assessed. *Number of records retrieved matching the abovementioned criteria*: "Seven". *Number of relevant records or full-text documents retrieved*: The retrieved records are not relevant to Bayer GM soybean products.
FSANZ	http://www.foodstandards.gov.au/consumer/gmfood/applications/Pages/default.aspx - Accessed on 16 August 2023. The webpage dedicated to current GM applications and approvals was checked. *Date of the most recent website update at the time of the search*: May 2023 *Limits applied*: The list for GM applications and approvals with 'Status' approved or under assessment starting from 2022 was assessed. *Number of records retrieved matching the abovementioned criteria*: "Three". *Number of relevant records or full-text documents retrieved*: The retrieved records are not relevant to Bayer GM soybean products.

CTNBio	http://ctnbio.mctic.gov.br/liberacao-comercial#/liberacao-comercial/consultar-processo – Accessed on 16 August 2023. The webpage dedicated to commercial releases (= Liberações Comerciais) was checked. *Date of the most recent website update at the time of the search*: Not clear (several dates mentioned) *Limits applied*: The list of commercial releases for plants (= plantas) starting from 2022 was assessed. *Number of records retrieved matching the abovementioned criteria*: "13". *Number of relevant records or full-text documents retrieved*: The retrieved records are not relevant to Bayer GM soybean products.
CONABIA	https://www.argentina.gob.ar/agroindustria/alimentos-y-bioeconomia/ogm-comerciales – Accessed on 16 August 2023. The webpage of the national advisory commission on agricultural biotechnology (= Comisión Nacional Asesora de Biotecnología Agropecuaria) was checked. *Date of the most recent website update at the time of the search*: Not available *Limits applied*: The list of events with commercial authorisation (= Eventos con autorización comercial) starting from 2022 were checked. *Number of records retrieved matching the abovementioned criteria*: "Four". *Number of relevant records or full-text documents retrieved*: One of the retrieved records is relevant to MON 87751[17]. It does not have any implication on the risk assessment, because no new hazards, modified exposure, or new scientific uncertainties are reported.
MAFF	https://www.maff.go.jp/j/syouan/nouan/carta/torikumi/attach/pdf/index-41.pdf Accessed on 16 August 2023. The weblink dedicated to list of approved genetically modified agricultural crops was checked. *Date of the most recent website update at the time of the search*: 13 July 2022 *Limits applied*: The list of GM agricultural crops with approval date ('承認日') starting from 01 01, 2022 was assessed. *Number of records retrieved matching the abovementioned criteria*: "11". *Number of relevant records or full-text documents retrieved*: The retrieved records are not relevant to Bayer GM soybean products.

[16] CFIA, 2022a. Decision document 2012-94: Determination of the safety of Monsanto Canada Inc.'s soybean (*Glycine max* (L.) Merr.) event MON 87708: https://inspection.canada.ca/plant-varieties/plants-with-novel-traits/approved-under-review/decision-documents/dd-2012-94/eng/1364910295912/1364910444165

CFIA, 2022b. Decision document DD2014-107: Determination of the safety of Monsanto Canada Inc.'s soybean (*Glycine max* (L.) Merr.) event MON 87751: https://inspection.canada.ca/plant-varieties/plants-with-novel-traits/approved-under-review/decision-documents/dd2014-107/eng/1496174616114/1496174668677

[17] CONABIA, 2022. Res. N° 28/2022 (12/05/2022): https://www.magyp.gob.ar/sitio/_pdf/RESOL-28-2022%20%20BO.pdf

Annex V. Results of the publication selection process for Bayer GM soybean products literature search in SciSearch and CABA databases using STN® database catalogue

Table 1. Results of the publication selection process.

Review question captured in the search	Number of publications
Publications identified after searches of the scientific literature in SciSearch and CABA databases (following de-duplication)	381
Publications excluded after rapid assessment for relevance	376
Publications screened using full-text documents	5
Publications excluded after detailed assessment for relevance	3
Unobtainable publications	0
Unclear publications	0
Publications considered relevant	2

Table 2. List of all relevant publications for Bayer GM soybean products retrieved after detailed assessment of full-text documents for relevance: ordered by category of information.

Products[1]	Study (author(s) and year)	Title	Source
Food/Feed safety assessment			
Composition			
MON 87701 × MON 89788	(Benevenuto *et al.,* 2023)	Integration of omics analyses into GMO risk assessment in Europe: a case study from soybean field trials	Environmental Sciences Europe
Agronomic and phenotypic characteristics			
MON 89788 MON 87708 × MON 89788	(Mobli *et al.*, 2022)	Conventional and transgenic herbicide-resistant soybean cultivars yielded similarly across five site-years in Nebraska	Crop, Forage & Turfgrass Management

[1] Products not listed above don't have relevant publication retrieved in this monitoring season.

Table 3. List of publications excluded from the risk assessment after detailed assessment of full-text documents, with the reason(s) for exclusion

Study authors	Year	Title	Source	Reasons for exclusion based on the eligibility/ inclusion criteria
Chen *et al*	2023	Registration of 'S16-5503GT' soybean cultivar with high yield, broad adaptation, and glyphosate tolerance.	Journal of Plant Registrations	Comparative study without the use of a non-GM comparator
Pereira Braz *et al*	2022	Agronomic performance of RR® soybean submitted to glyphosate application associated with a product based on *Bacillus subtilis.*	Agronomy	Comparative study without the use of a non-GM comparator
Yin *et al*	2023	*In situ* proteomic analysis of herbicide-resistant soybean and hybrid seeds via matrix-assisted laser desorption/ionization-mass spectrometry imaging.	Journal of Agricultural and Food Chemistry	It is not a safety study on Bayer's GM soybean products

Table 6. **Report of the reliability and implications for the risk assessment of the relevant publication retrieved after detailed assessment of full-text document for relevance.**

Study author(s) and year	Reliability appraisal	Implications for the risk assessment[1]
Food/Feed Safety assessment		
Composition		
(Benevenuto *et al.*, 2023)	low	None, because no new hazards, modified exposure, or new scientific uncertainties are reported[2]
Agronomic and phenotypic characteristics		
(Mobli *et al.*, 2022)	Moderate	None, because no new hazards, modified exposure, or new scientific uncertainties are reported

[1] Identification of a new hazard, modified exposure, or new scientific uncertainty requiring further consideration in the risk assessment; **None**, because no new hazards, modified exposure, or new scientific uncertainties are reported; **None**, because the findings reported in the study are not reliable; Implications for risk assessment were previously considered by EFSA and/or its GMO Panel, and are therefore not addressed further here (EFSA, 2019)[2].

REFERENCES

Benevenuto RF, Zanatta CB, Waßmann F, Eckerstorfer MF and Agapito-Tenfen SZ, 2023. Integration of omics analyses into GMO risk assessment in Europe: a case study from soybean field trials. Environmental Sciences Europe, 35, 14.

Mobli A, Arneson NJ, Spicka S, Glewen K, Proctor CA and Werle R, 2022. Conventional and transgenic herbicide-resistant soybean cultivars yielded similarly across five site-years in Nebraska. Crop, Forage & Turfgrass Management, 8, e20189.

Annex VI. List of relevant publications retrieved from SciSearch and CABA databases using STN® database catalogue (provided in .RIS format)

The list of the relevant publications is enclosed with this report (*see* soybean.txt file).