

Title

**Summary of the Literature Review for GHB614 x LLCotton25 x MON 15985 cotton stack
August 1, 2020 – September 30, 2021**

Final ReportData or guideline requirement

Explanatory note on literature searching
conducted in the context of GMO applications for (renewed) market authorization
and annual post-market environmental monitoring reports on GMOs authorised in the EU market.
EFSA supporting publications 2019:EN-1614

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Principal author

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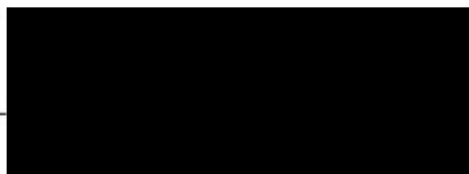
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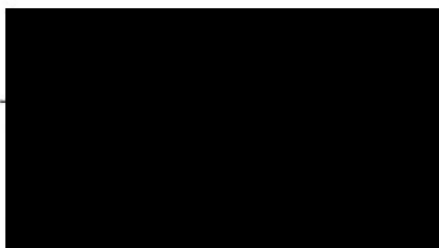


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SIGNATURE PAGE

Principal author:



Date

2021-11-09

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Agency website search	Global Regulatory Manager
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Stage 2 assessment	<u>Food and Feed safety</u> [REDACTED] [REDACTED] <u>Molecular characterization</u> [REDACTED] [REDACTED] <u>Environmental safety</u> [REDACTED] [REDACTED]
Report	[REDACTED] [REDACTED] [REDACTED]

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SUMMARY

BASF has used conventional breeding techniques to develop the stacked trait cotton product GHB614 x LLCotton25 x MON 15985 (GLB2 cotton) which confers resistance to lepidopteran insects and tolerance to glyphosate and glufosinate-ammonium herbicides. The OECD identifier is BCS-GHØØ2-5 x ACS-GHØØ1-3 x MON-15985-7.

A scoping review was performed for the GHB614 x LLCotton25 x MON 15985 cotton stack and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2. The objective of this scoping review was to determine if there were studies about the molecular characterization of GHB614 x LLCotton25 x MON 15985 cotton stack, its effect on food and feed safety or environmental safety, that might require in-depth examination. A set of broad literature searches was performed using several bibliographic databases covering scientific literature from August 1, 2020 to September 30, 2021. Additional sources of information, such as web pages of food safety, agriculture, and biotechnology-related authorities were searched for the same time window, along with the bibliographies of relevant reviews. The references identified were evaluated for potential relevance to the scoping review questions according to pre-defined criteria.

These literature searches identified a total of 55 unique publications, which were subject to rapid assessment to exclude obviously irrelevant publications. A total of five publications were progressed for detailed assessment and were determined to be not relevant after detailed review.

No new publications were found that contained new data on the molecular characterization of the GHB614 x LLCotton25 x MON 15985 cotton and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2. Similarly, no new publications were found that suggested any potential adverse effects of GHB614 x LLCotton25 x MON 15985 cotton on human health, animal health, or the environment. No issues or topics were identified that would trigger or warrant more specific question formulation or indicate that a systematic review would be of value.

1. INTRODUCTION

BASF has used conventional breeding techniques to develop the stacked trait cotton product GHB614 x LLCotton25 x MON 15985 (GLB2 cotton) which confers resistance to lepidopteran insects and tolerance to glyphosate and glufosinate-ammonium herbicides. The OECD identifier is BCS-GHØØ2-5 x ACS-GHØØ1-3 x MON-15985-7.

The objective of the literature searches described here was to determine if there were studies published between August 1, 2020 and September 30, 2021 that mention the molecular characterization of the GHB614 x LLCotton25 x MON 15985 cotton, and/or any adverse effect of GHB614 x LLCotton25 x MON 15985 cotton stack in food, feed or the environment. In that context, a broad and inclusive literature search was performed, and the articles retrieved were reviewed in a comprehensive and transparent manner. This was intended as a scoping review. The literature review was performed as recommended in the European Food Safety Authority (EFSA) explanatory note on literature searching conducted in the context of Genetically Modified Organisms (GMO)¹ applications and post-market environmental monitoring activities (2019).

The literature searches were performed for the GHB614 x LLCotton25 x MON 15985 cotton stack and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2. The search terms also included relevant synonyms, trade names and intended traits. Plant species and general GMO terms were used if needed.

2. OVERALL METHODS

2.1. Objective of the scoping review

The objective of the scoping review was to survey the evidence base for the GHB614 x LLCotton25 x MON 15985 cotton stack and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2, in order to identify any specific issues related to food or feed safety, molecular characterization or environmental safety that might require in-depth examination.

2.2. Review questions

Review questions were formulated to conform to PE(I)CO structure (Population, Exposure (Intervention), Comparators, Outcome) if possible, and to address data requirements. They were modeled after the review question examples provided in the EFSA 2019 explanatory note¹.

Question 1: Were any studies published during the reporting period that describe adverse effects on human or animal health or the environment of the GHB614 x LLCotton25 x MON 15985 cotton stack and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2?

Key elements:

Population: Human health; animal health; environmental safety

Exposure: GHB614 x LLCotton25 x MON 15985 cotton stack, derived food/feed products, newly expressed proteins in GHB614 x LLCotton25 x MON 15985 cotton stack

Comparators: When applicable, comparable populations or subjects exposed to appropriate controls (e.g., vehicle only, innocuous control protein, non-GM comparator) or conventional counterpart used for comparative analysis of plant material

Outcome: Adverse effects

Question 2: Were any studies published during the reporting period that focus on molecular characterization of the GHB614 x LLCotton25 x MON 15985 cotton stack and its newly expressed proteins 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2 in cotton?

Key elements:

Population: GHB614 x LLCotton25 x MON 15985 cotton stack and newly expressed proteins in GHB614 x LLCotton25 x MON 15985 cotton stack

Outcome: Molecular characterization (which would indicate the information/data requirement for molecular characteristics)

2.3. Criteria for relevance

Criteria for establishing the relevance of retrieved publications were defined prior to conduct of the search. These criteria were modeled after those given in the EFSA 2019 explanatory note¹ and are described in [Table 1](#).

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

Concepts	Criteria	Comment
Key elements of review questions with PECO structure		
Population	The publication addresses human and animal health, and/or the environment (including biodiversity, ecosystem services, service providing units, and endangered species) as general protection goals	From the publications that address the GMO under consideration, those that address protection goals relevant to the risk assessment of the GMO are eligible
Exposure (Intervention)	The publication addresses the GMO, derived food/feed products, and/or the intended trait(s) (e.g., newly expressed proteins(s)) that are identical or like those under regulatory review	This enables the selection of publications that address the GMO, derived food/feed products, and/or the intended trait(s) under consideration
Comparator	If the publication reports a comparative study that uses plant material as test material, eligible publications must report a non-GM variety as comparator	In those cases where the publication addresses the GMO under consideration, reports a comparative analysis study and uses plant material as test material, eligible publications also need to include an appropriate non-GM line as comparator
Outcome	The publication addresses effects/impacts on human and animal health, and/or the environment	Publications that address the GMO under consideration also need to address effects/impacts on entities of concern, and potential determinants of exposure that place these entities at risk, in order to be relevant to the risk assessment of the GMO
Additional concepts		

Concepts	Criteria	Comment
Information/data requirements	The publication reports information pertaining to one or more information/data requirement(s) outlined in Appendix A for the GMO and derived food/feed products under consideration, including the intended trait(s)	Publications that potentially contribute to the knowledge informing the risk assessment of the GMO under consideration, and thus the risk hypotheses addressed, taking account of both hazard and exposure, can be considered relevant according to this eligibility/inclusion criterion. Publications addressing other issues such as benefits, socio-economics, ethics, crop protection, detection methods, efficacy, public perception and risk communication can be excluded, as they are not necessarily relevant to the risk assessment of GMOs
Plant species	The publication addresses the same plant species as the GMO under consideration	This eligibility/inclusion criterion permits the exclusion of publications on GMOs that contain the same intended trait(s) as the GMO under consideration, but which are introduced in another plant species
Scope of GMO application	The publication addresses pathways and levels of exposure to the GMO, derived food/feed products, and the intended trait(s) that are relevant for the intended uses of the GMO and derived food/feed products under regulatory review	From the publications that address the GMO under consideration, those that consider pathways and levels of exposure relevant to the scope of the GMO application (i.e., import and processing for food/feed uses, cultivation) are eligible
Target pests/organisms	The publication addresses target pests/organisms that are established in the EU	This permits the exclusion of publications that address interactions between the GMO and target pests/organisms that do not occur in the EU

Concepts	Criteria	Comment
Stacked events obtained by conventional crosses/ subcombinations	The publication addresses the higher stacked event and/or a subcombination or subcombinations of the single events of the higher stacked event, independently of its/their origin	This permits the selection of publications on the higher stacked event and/or subcombinations of the single events of the higher stacked event that are in the scope of the GMO application(s), independently of their origin. This permits the exclusion of publications on the single events of the higher stacked event, because the risk assessment of GMO applications for stacked events covers only the products in the scope of the GMO application – i.e., the higher stacked event and subcombinations of the singles involved, independently of their origin
Molecular stacks	The publication addresses: the molecular stack; all newly expressed proteins in the molecular stack; and/or one or several of the newly expressed proteins in the molecular stack that has/have not been previously risk assessed by EFSA and/or its GMO Panel and for which no safe use has been determined yet by EFSA and/or its GMO Panel	This permits the exclusion of publications that address one or several (not all) of the newly expressed proteins in the molecular stack that has/have been previously risk assessed by EFSA and/or its GMO Panel and for which the safe use has been determined by EFSA and/or its GMO Panel
Previously risk assessed publications	The publication has not been previously risk assessed by EFSA and/or its GMO Panel and is not cited/referenced in an EFSA/GMO Panel output	This permits the exclusion of publications that have been previously risk assessed by EFSA and/or its GMO Panel and cited/referenced in an EFSA/GMO Panel output
Access	Full-text document is accessible	If potentially relevant full-text documents cannot be obtained, they should be listed in a table with a description of the (unsuccessful) methods that have been used to try to obtain a copy

Concepts	Criteria	Comment
Reporting format	The publication presents original/primary data, or it is a risk assessment from a relevant key organisation (such as regulatory agencies and risk assessment bodies involved in the risk assessment of GMOs)	This permits the exclusion of publications that do not present original/primary data (e.g., editorials, position papers), and the inclusion of relevant risk assessments performed and reported by relevant key organisations. Reviews should only be included if they present data that are not available from a primary research study
Reporting format	A study in a publication should only be presented once, but if it is presented in more than one publication, all publications should be listed and grouped	Duplicate publications should be excluded at the screening stage. Only one copy of a study is required even if it is reported in different publications, and identified in more than one database

Table adapted from 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.

2.4. Reference publication

Two publication related to GHB614 x LLCotton25 x MON 15985 cotton stack were previously identified and used to test and validate the search strategy:

- Naegeli, H.; Birch, A. N.; Casacuberta, J.; Schrijver, A. de; Gralak, M. A.; Guerche, P.; Jones, H.; Manachini, B.; Messean, A.; Nielsen, E. E.; Nogue, F.; Robaglia, C.; Rostoks, N.; Sweet, J.; Tebbe, C.; Visioli, F.; Wal, J. M.; Broll, H.; Gennaro, A.; Neri, F. M.; Paraskevopoulos, K.; de Schrijver, A. (2018). Assessment of genetically modified cotton GHB614 .times. LLCotton25 .times. MON 15985 for food and feed uses, under Regulation (EC) No 1829/2003 (application EFSA-GMO-NL-2011-94). EFSA Journal 16(4): e05213 p.
- Assif, M.; Siddiqui, H.A.; Naqvi, R. Z.; Amin, I.; Asad, S.; Mukhtar, Z.; Bashir, A.; Mansoor. S. (2021). Development of event-specific detection method for identification of insect resistant NIBGE-1601 cotton harboring double gene Cry1Ac-Cry2Ab construct. Scientific Reports 11, article 3479.

The first article is directly relevant for the GHB614 x LLCotton25 x MON 15985 cotton stack, while the second article mentions event MON 15985, its newly expressed proteins Cry1Ac and Cry2Ab, the crop (cotton) and one of the intended traits (insect resistance).

Since one of these references was published before the current search period, the search profile was tested without applying the time limit used in the final search profile (UP>=20200801 and UP<=20210930).

3. SEARCH METHODS AND OUTCOMES

The search strategies used here followed the 2019 EFSA explanatory note on literature searching conducted in the context of GMO applications and post-market environmental monitoring activities¹. The search strategies were designed to be broad and sensitive enough to capture any relevant publications, if available.

An information specialist with background in plant biotechnology selected the databases, identified relevant search terms, developed search profiles, designed search strategies, and conducted the searches.

3.1. Time window and date of the literature search

The database searches were performed on October 22, 2021. Only documents updated between August 1, 2020 and September 30, 2021, were considered in the search. The dates of most recent database updates are provided in [Table 3](#).

3.2. Databases used in the literature search

All searches were performed in the host STN (Scientific and Technical Information Network), an online database service operated jointly by CAS and FIZ Karlsruhe. STN provides access to a broad range of databases from the most renowned database producers worldwide.

The searches described here were performed in five databases: three multidisciplinary/large databases (Biosis, Medline and CA-Plus) and two subject-specific databases focused on agriculture-related topics (Agricola and CABA).

See [Appendix 1](#) for detailed database descriptions.

3.3. Search strategy

The search profile was designed to capture the higher level stack and substack combinations. It covers event names, trade names, newly expressed proteins, and intended traits. Since the “intended trait” profiles produced too many results when used on its own, it was combined with additional profiles: a ‘general GMO’ profile and a ‘plant species’ profile. The reference publications ([Section 2.4](#)) were identified by the search profiles confirming the validity of the applied search strategy. See [Table 2](#) for a detailed search profile.

Table 2: Search profile for database search

Set	Search string	Concepts
1	GHB614 OR GHB(W) 614 OR BCS-GH002-5 OR BCSGH002-5 OR BCS(W) GH002(W) 5 OR BCSGH002(W) 5 OR BCS-GH002-5 OR BCS(W) GH002(W) 5 OR BCSGH002(W) 5 or GHB614x OR GHB(W) 614x OR BCS-GH002-5x OR BCSGH002-5x OR BCS(W) GH002(W) 5x OR BCSGH002(W) 5x OR BCS-GH002-5x OR BCS(W) GH002(W) 5x OR BCSGH002(W) 5x	Event name GHB614
2	LLcotton25 or LLcotton(w)25 or LL(w)cotton25 or LL(w)cotton(w)25 or ACS-GH001-3 or ACS(w) GH001(w) 3 or ACSGH001(w) 3 or ACS-GH001-3 or ACS(w) GH001(w) 3 or ACSGH001(w) 3 or LLcotton25x or LLcotton(w)25x or LL(w)cotton25x or LL(w)cotton(w)25x or ACS-GH001-3x or ACS(w) GH001(w) 3x or ACSGH001(w) 3x or ACS-GH001-3x or ACS(w) GH001(w) 3x or ACSGH001(w) 3x or xLLcotton25	Event name LLCotton25

Set	Search string	Concepts
	or xLLcotton(w)25 or xLL(w)cotton25 or xLL(w)cotton(w)25 or xACS-GH001-3 or xACS(w)GH001(w)3 or xACSGH001(w)3 or xACS-GH001-3 or xACS(w)GH001(w)3 or xACSGH001(w)3 or xLLcotton25x or xLLcotton(w)25x or xLL(w)cotton25x or xLL(w)cotton(w)25x or xACS-GH001-3x or xACS(w)GH001(w)3x or xACSGH001(w)3x or xACS-GH001-3x or xACS(w)GH001(w)3x or xACSGH001(w)3x	
3	MON(w)15985 or MON15985 or MON-15985-7 or MON(w)15985(w)7 or MON15985(w)7 or xMON(w)15985 or xMON15985 or xMON-15985-7 or xMON(w)15985(w)7 or xMON15985(w)7	Event name MON 15985
4	GHB614XLLcotton25xMON15985 or GHB(w)614XLLcotton25xMON15985 or GHB614XLL(w)cotton25xMON15985 or GHB614XLLcotton(w)25xMON15985 or GHB614XLLcotton25xMON(w)15985 or GHB(w)614XLL(w)cotton25xMON15985 or GHB(w)614XLLcotton(w)25xMON15985 or GHB(w)614XLLcotton25xMON(w)15985 or GHB(w)614XLL(w)cotton(w)25xMON15985 or GHB(w)614XLL(w)cotton25xMON(w)15986 or GHB(w)614XLL(w)cotton(w)25xMON(w)15985 or GHB614(w)time#(w)LLcotton25(w)time#(w)MON15985 or GHB614(w)time#(w)LLcotton25(w)time#(w)MON(w)15985	Event name stack
5	(1 and 2) or (1 and 3) or (2 and 3) or 4	Event name all
6	GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(w)TOL? OR GLY(w)TOLTM? OR GLY(w)TOLRTM?	Trade name GHB614
7	libertylink or liberty(w)link or libertylinktm or liberty(w)linktm or libertylinkrtm or liberty(w)linkrtm	Trade name LLCotton25
8	bollgard? or bolgard?	Trade name MON 15985
9	(6 and 7) or (6 and 8) or (7 and 8)	Trade name all
10	(2MEPSPS or 2(w)MEPSPS or 2M(w)EPSPS or 2(w)M(w)EPSPS) or ((EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVOYLSHIKIMATE OR ENOYLPYRUVOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4W) (PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE) or (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC or ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE) or (ENOL(W)PYRUVOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE) (3W) PHOSPHATE (W) (SYNTHASE OR SYNTHETASE) or (PHOSPHOSHIKIMATE (2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE (2W) CARBOXYVINYL (W) TRANSFERASE OR ENOLPYRUVOYL (W) SHIKIMIC (3W) PHOSPHOSYNTHASE) (s) ((DOUBL# or DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M))	Newly expressed proteins GHB614
11	((bar or pat) (2a) (gene# or protein# or enzyme#)) or ppt(2w)acetyltransferase or ppt(2w)acetyl(w)transferase or	Newly expressed proteins LLCotton25

Set	Search string	Concepts
	pt(w)n(2w)acetyltransferase or pt(w)n(2w)acetyl(w)transferase or phosphinothricin(w)n(w)acetyltransferase or phosphinothricin(2w)acetyltransferase or phosphinothricin(2w)acetyl(w)transferase or phosphinothricinacetyl(w)transferase	
12	crylaC# or cry(w)l(w)aC# or cry(w)laC# or cryl(w)aC# or cryl(w)a(w)c# or cry(w)l(w)a(w)c# or cryla(w)c# or cryIaC# or cry(w)I(w)aC# or cry(w)IaC# or cryI(w)aC# or cryI(w)a(w)c# or cry(w)I(w)a(w)c# or cryIa(w)c# or crylaC# or cry(w)l(w)aC# or cry(w)laC# or cryl(w)aC# or cryl(w)a(w)c# or cry(w)l(w)a(w)c# or cryla(w)c# or Cry2Ab2 or Cry(w)2Ab2 Cry2(w)Ab2 or Cry2A(w)b2 or Cry2Ab(w)2 or Cry2(w)Ab(w)2 or Cry(w)2(w)Ab2 or Cry(w)2(w)A(w)b2 or CryiiAb2 or Cry(w)iiAb2 Cryii(w)Ab2 or CryiiA(w)b2 or CryiiAb(w)2 or Cryii(w)Ab(w)2 or Cry(w)ii(w)Ab2 or Cry(w)ii(w)A(w)b2	Newly expressed proteins MON 15985
13	(10 and 11) or (10 and 12) or (11 and 12)	Newly expressed proteins all
14	(herbicid? or GL!PHOSATE# or GL!FOSATE# OR G360 or g(w)360 or roundup? or round(w)up?) (5a) (resist? or toleran? or protect?)	Intended traits GHB614
15	(herbicid? or bialaphos or basta or glufosinate or gluphosinate or phosphinothricin or liberty?) (5a) (resist? OR protect? OR toleran?)	Intended traits LLCotton25
16	(Insect# OR pest# OR Lepidoptera# OR Noctuidae OR Crambidae OR borer# OR cornborer# OR stalkborer# OR earworm# OR ear(w)worm# OR armyworm# OR army(w)worm# OR cutworm# OR cut(w)worm# OR Ostrinia OR O(w)nubilalis OR Sesamia OR S(w)nonagrioides or Diatraea OR D(w)grandiosella OR D(w)crambidoides OR Helicoverpa OR H(w)zea OR Spodoptera OR S(w)frugiperda OR Papaipema OR P(w)nebris OR Elasmopalpus OR E(w)lignosellus OR D(w)saccharalis OR Striacosta OR S(w)albicosta or Agrotis OR A(w)ipsilon OR S(w)cretica OR Mythimna OR M(w)unipuncta OR ECB OR MCB OR SWCB OR SCSB OR CEW OR FAW OR SCB OR WBC) (5a) (resist? OR protect? OR toleran?)	Intended traits MON 15985
17	(14 and 15) or (14 and 16) or (15 and 16)	Intended traits all
18	cotton# or gossypium or G(w)hirsutum or g(w)barbadense	Plant species
19	GMO OR GMOs OR LMO OR LMOs OR GM OR GE OR transgen? OR (genetic?(3a)(modif? OR transform? OR manipulat? OR improv? OR engineer?))	GMO general
20	17 and 18 and 19	Intended traits all AND Plant species AND GMO general
21	5 or 9 or 13 or 20	Event name all OR Trade name all Newly expressed proteins all species) OR (Intended traits all AND Plant species AND GMO general)

All searches were performed in the Basic Index (BI) field, which includes the following subject headings/field names:

- **Agricola:** title (TI), controlled term (CT), supplementary term (ST), abstract (AB), named person (NA), corporate name (CO), note (NTE), geographic term, CABA and other fields (GT)
- **Biosis:** title (TI), abstract (AB), biosystematic codes (BC), chemical name (CN), controlled term (CT), gene name (GEN), geographic term (GT), organism (ORGN) and supplementary term (ST); as well as CAS Registry Numbers (RN)
- **CA-Plus:** title (TI), supplementary term (ST), index term (IT) and abstract (AB); as well as CAS Registry Numbers
- **CABA:** title (TI), controlled term (CT), supplementary term (ST), broader term (BT), abstract (AB), organism name (ORGN) and geographic term (GT); as well as CAS Registry Numbers
- **Medline:** title (TI), chemical name (CN), gene name (GEN), controlled term (excluding MeSH numbers) (CT), supplementary term (ST), named person (NA), other source (OS), and abstract (AB), as well as CAS Registry Numbers and GenBank Numbers

Relevant controlled terms ([Table 3](#)) were not searched separately because they are included in the Basic Index and were captured by the free-text searches.

Table 3: Relevant controlled terms (CT) and index terms (IT) in each database

Database	Event	New proteins	Intended traits	Plant species	GM plants
Agricola	None	None	"HERBICIDE RESISTANCE" No terms for insect resistance	"GOSSYPIMUM BARBADENSE" "GOSSYPIMUM HIRSUTUM"	"TRANSGENIC PLANTS"
Biosis	None	None	No terms for herbicide or insect resistance	"GOSSYPIMUM BARBADENSE" "GOSSYPIMUM HIRSUTUM"	None
CABA	None	None	"HERBICIDE RESISTANCE" No terms for insect resistance	"GOSSYPIMUM BARBADENSE"/CT "GOSSYPIMUM HIRSUTUM"/CT	"TRANSGENIC PLANTS"
CAS	None	None	"HERBICIDE RESISTANCE" No terms for insect resistance	GOSSYPIMUM/CT	"GENETICALLY MODIFIED PLANTS"
Medline	None	None	"HERBICIDE RESISTANCE" No terms for insect resistance	"GOSSYPIMUM BARBADENSE" "GOSSYPIMUM HIRSUTUM"	"PLANTS, GENETICALLY MODIFIED"

The search results were limited to documents updated between August 1, 2020 and September 30, 2021 (UP>=20200801 and UP<=20210930), and to non-patent documents (not P/DT). To ensure that documents with indexing errors where two document types (DTs) (one eligible and one ineligible) were attached to a single record were not missed, documents with both 'journal' and 'patent' as document type were also kept. These putative documents would be identified with (P/DT AND J/DT) in CABA and CAPLUS.

[Table 4](#) summarizes the number of results obtained from each of the databases searched.

See [Appendix 2](#) for a complete search history.

Table 4: Overview of the selected databases and summary of search results from each database

Database	AGRICOLA	BIOSIS	CAB Abstracts	CAPLUS	MEDLINE
Database Provider	STN International	STN International	STN International	STN International	STN International
Coverage	1970-present	1926-present	1973-present	1907-present	1946-present
Date of search	22 Oct 2021	22 Oct 2021	22 Oct 2021	22 Oct 2021	22 Oct 2021
Datespan of the search	1 Aug 2020 – 30 Sept 2021	1 Aug 2020 – 30 Sept 2021	1 Aug 2020 – 30 Sept 2021	1 Aug 2020 – 30 Sept 2021	1 Aug 2020 – 30 Sept 2021
Latest database update	11 Oct 2021	20 Oct 2021	19 Oct 2021	21 Oct 2021	21 Oct 2021
Number of records retrieved	5	16	25	10	7
Number of records after duplicate removal	5	14	22	7	7
Number of relevant records after rapid assessment	1	1	0	1	2

4. INTERNET AND MANUAL SEARCHES

4.1. Internet Searches of food safety, agriculture, and biotechnology-related authority webpages

A search of the web pages of food safety, agriculture, and biotechnology-related authorities was conducted. Search results were manually examined for relevant records that were either published during the time period under consideration (date span of search: August 1, 2020 to September 30, 2021) or refer to relevant records published during this time frame. Relevance of results were

determined based on the criteria listed in [Table 1](#) and they were summarized in [Table 5](#). All web pages searched were justified by their recommendation in the EFSA 2019 explanatory note¹. Of the 13 key organisations cited in the EFSA 2019 explanatory note¹, Environment and Climate Change Canada and Intersecretarial Commission on Biosafety of GMOs (CIBIOGEM) were excluded, since they are not involved in the risk assessment of GM plants. The EPA, USDA, FDA, CFIA, Health Canada, FSANZ and MAFF websites were excluded, since these agencies do not regulate GM stacked products obtained by conventional breeding techniques. Therefore, the internet search was limited to four key organisations relevant for GHB614 x LLCotton25 x MON 15985 cotton stack. Search terms consisted of GHB614 x LLCotton25 x MON 15985 cotton stack or BCS-GHØØ2-5 x ACS-GHØØ1-3 x MON-15985-7 or trait-specific protein(s) in GHB614 x LLCotton25 x MON 15985 cotton stack (all searched singly, with no search limits applied).

Table 5: Results of search of food safety, agriculture, and biotechnology-related authority websites

Source Site Name	Website URL	Date of Most Recent Site Update	Date of Search	No. of Relevant Records
Office of the Gene Technology Regulator (OGTR) Australia	http://www.ogtr.gov.au/	Oct 10, 2021	Oct 10, 2021	0
National Technical Commission on Biosafety (CTNBio) Brazil	http://ctnbio.mcti.gov.br/en	Oct 2021	Oct 13-15, 2021	0
National Advisory Commission on Agricultural Biotechnology (CONABIA) Argentina	https://www.argentina.gob.ar/agroindustria/bioeconomia/biotecnologia	Oct 1, 2021	Oct 18, 2021	0
Genetic Engineering Approval Committee (GEAC) India	http://moef.gov.in/	Oct 2021	Oct 14, 2021	0

4.2. Manual searches of reference lists of recent review articles

Recent review articles as sources of reference lists to search for potentially relevant studies were identified via searches of PubMed.gov for general terms such as “GMO” or “GM crops” in the titles and abstracts. The search of PubMed.gov was also restricted to recent reviews published between August 1, 2020 and September 30, 2021. The resulting number of relevant studies found within the bibliographies of these review articles is given in [Table 6](#).

Table 6: Documents for which reference lists were scanned for relevant studies

No	Author(s) and Year	Title	Source	Number of relevant bibliographic references retrieved
1	Golnar AJ, Ruell E, Lloyd AL, Pepin KM. 2021	Embracing Dynamic Models for Gene Drive Management.	Trends Biotechnol. 2021 Mar;39(3):211-214. doi: 10.1016/j.tibtech.2020.08.011. Epub 2020 Sep 30. PMID: 33010965.	0
2	Gupta S, Kumar A, Patel R, Kumar V. 2021	Genetically modified crop regulations: scope and opportunity using the CRISPR-Cas9 genome editing approach.	Mol Biol Rep. 2021 May;48(5):4851-4863. doi: 10.1007/s11033-021-06477-9. Epub 2021 Jun 10. PMID: 34114124.	0
3	Hadrup N, Frederiksen M, Wedeby EB, Nikolov NG, Carøe TK, Sørli JB, Frydendall KB, Liguori B, Sejbaek CS, Wolkoff P, Flachs EM, Schlünssen V, Meyer HW, Clausen PA, Hougaard KS. 2021	Asthma-inducing potential of 28 substances in spray cleaning products-Assessed by quantitative structure activity relationship (QSAR) testing and literature review.	J Appl Toxicol. 2021 Jul 11. doi:10.1002/jat.4215. Epub ahead of print. PMID: 34247391.	0
4	Kumar V, Guleria P. 2020	Application of DNA-Nanosensor for Environmental Monitoring: Recent Advances and Perspectives.	Curr Pollut Rep. 2020 Dec 12:1-21. doi: 10.1007/s40726-020-00165-1. Epub ahead of print. PMID: 33344145; PMCID: PMC7732738.	0
5	Hameed A, Mehmood MA, Shahid M, Fatma S, Khan A, Ali S. 2020	Prospects for potato genome editing to engineer resistance against viruses and cold-induced sweetening.	GM Crops Food. 2020 Oct 1;11(4):185-205. doi: 10.1080/21645698.2019.1631115. Epub 2019 Jul 6. PMID: 31280681; PMCID: PMC7518746.	0
6	Leska A, Nowak A, Nowak I, Górczyńska A. 2021	Effects of Insecticides and Microbiological Contaminants on <i>Apis mellifera</i> .	Health. Molecules. 2021 Aug 22;26(16):5080. doi: 10.3390/molecules26165080. PMID: 34443668; PMCID: PMC8398688	0

No	Author(s) and Year	Title	Source	Number of relevant bibliographic references retrieved
7	Madzak C. 2021	<i>Yarrowia lipolytica</i> Strains and Their Biotechnological Applications: How Natural Biodiversity and Metabolic Engineering Could Contribute to Cell Factories Improvement.	J Fungi (Basel). 2021 Jul 10;7(7):548. doi: 10.3390/jof7070548. PMID: 34356927; PMCID: PMC8307478.	0
8	Menz J, Modrzejewski D, Hartung F, Wilhelm R, Sprink T. 2020	Genome Edited Crops Touch the Market: A View on the Global Development and Regulatory Environment.	Front Plant Sci. 2020 Oct 9;11:586027. doi: 10.3389/fpls.2020.586027. PMID:33163013; PMCID: PMC7581933.	0
9	Mushtaq M, Ahmad Dar A, Skalicky N, Tyagi A, Bhagat N, Basu U, Bhat BA, Zaid A, Ali S, Dar TU, Rai GK, Wani SH, Habib-Ur-Rahman M, Hejnak V, Vachova P, Brestic M, Çiğ A, Çiğ F, Erman M, El Sabagh A. 2021	CRISPR-Based Genome Editing Tools: Insights into Technological Breakthroughs and Future Challenges.	Genes (Basel). 2021 May 24;12(6):797. doi: 10.3390/genes12060797. PMID: 34073848; PMCID: PMC8225059.	0
10	Okoli AS, Blix T, Myhr AI, Xu W, Xu X. 2021	Sustainable use of CRISPR/Cas in fish aquaculture: the biosafety perspective.	Transgenic Res. 2021 Jul 25. doi:10.1007/s11248-021-00274-7. Epub ahead of print. PMID: 34304349.	0
11	Teferra TF. 2021	Should we still worry about the safety of GMO foods? Why and why not? A review.	Food Sci Nutr. 2021 Jul 27;9(9):5324-5331. doi: 10.1002/fsn3.2499. PMID: 34532037; PMCID: PMC8441473.	0
12	Turnbull C, Lillemo M, Hvoslef-Eide TAK. 2021	Global Regulation of Genetically Modified Crops Amid the Gene Edited Crop Boom - A Review.	Front Plant Sci. 2021 Feb 24;12:630396. doi: 10.3389/fpls.2021.630396. PMID: 33719302; PMCID: PMC7943453	0
13	Woźniak E, Tyczewska A, Twardowski T.	A Shift Towards Biotechnology: Social Opinion in the EU.	Trends Biotechnol. 2021 Mar;39(3):214-218. doi: 10.1016/j.tibtech.2020.08.0	0

No	Author(s) and Year	Title	Source	Number of relevant bibliographic references retrieved
	2021		01. Epub 2020 Sep 4. PMID: 32896439.	
14	Zhang Y, Restall J, Crisp P, Godwin I, Liu G. 2021	Current status and prospects of plant genome editing in Australia.	In Vitro Cell Dev Biol Plant. 2021 May 24;1-10. doi: 10.1007/s11627-021-10188-y. Epub ahead of print. PMID: 34054265; PMCID: PMC8143062.	0

5. RESULTS OF THE STUDY IDENTIFICATION AND SELECTION PROCESS

The database searches ([Section 3](#)) identified a total of 63 references, which were reduced to 55 after removal of duplicates ([Table 4](#)). No additional studies were identified in the manual searches ([Section 4](#)).

5.1. Screening of titles and abstracts to exclude obviously irrelevant references (Stage 1)

All references identified in the database searches described in [Section 3](#) were assessed for relevance based on information in their title and abstract by two reviewers independently. If opinions of relevance differed, the discrepancies were discussed between the reviewers and if a disagreement persisted, the publication under the discussion was transferred to Stage 2 for detailed evaluation by the experts. In this search, both evaluators were in 100 % agreement.

Clearly irrelevant records were tagged as “Not Relevant”. These included:

- Duplicated entries
- Secondary literature (reviews), other than assessments from regulatory agencies
- Articles on non-relevant topics like detection methods, socio-economic implications of GM crops, GM policy, agronomical performance, other herbicide resistant GM crops, other insect resistant GM crops, unrelated topics, etc.

Publications which appeared to be relevant and those of unclear relevance were tagged as “Relevant” and progressed to Stage 2 (detailed assessment; see [Section 5.2](#)).

The number of publications excluded after rapid assessment for relevance is presented in [Table 7](#) documenting the selection process.

5.2. Detailed assessment of eligible references (Stage 2)

Publications tagged as “Relevant” in Stage 1 were assessed in detail independently by two scientific experts in each of three corresponding areas (i.e., Molecular Biology, Food and Feed Safety, Environmental Safety), based on the full text of the publications. If opinions of relevance differed between reviewers within each area, the initial reviewers discussed the discrepancy as necessary and consulted additional reviewers to resolve the discrepancy if needed.

In the relevance assessment of the literature review for the GHB614 x LLCotton25 x MON 15985 cotton, reviewers agreed in 100% of the Stage 2 evaluations.

[Table 7](#) gives an overview of the reference selection process and results of the detailed assessment.

Table 7: Results of the publication selection process

Total number of publications retrieved after all searches of the scientific literature (excluding duplicates)	55
Number of publications excluded from the search results after rapid assessment for relevance (Stage 1)	50
Total number of full-text documents assessed in detail	5
Number of publications excluded from further consideration after detailed assessment for relevance (Stage 2)	5
Total number of unobtainable/unclear publications	0
Total number of relevant publications	0

[Table 8](#) lists the publications determined to be relevant along with their potential impact on the safety assessment based on detailed evaluation. Publications that were clearly not relevant after a detailed assessment are listed in [Table 9](#). [Table 10](#) lists the publications for which full-text documents were unobtainable for detailed assessment or for which relevance was unclear after detailed assessment.

Table 8: Report of all relevant publications retrieved after detailed assessment of full-text documents for relevance: ordered by category of information/data requirement(s)

Main category of information/data requirement	Study Author(s). Year	Title
Molecular Characterization	No studies in this category	
Food & Feed Safety	No studies in this category	
Environmental Safety	No studies in this category	

Table 9: Report of publications excluded from the risk assessment after detailed assessment of full-text documents

Study (Author(s) and year)	Title	Source	Reason(s) for exclusion based on eligibility/inclusion criteria listed in Table 1
Fast, Brandon J. Shan, Guomin. Herman, Rod A. Gampala, Satyalinga Srinivas. 2020	Transgene expression in sprayed and non-sprayed herbicide-tolerant genetically engineered crops is equivalent.	Regulatory toxicology and pharmacology: RTP, (2020 Mar) Vol. 111, pp. 104572. Electronic Publication Date: 26 Dec 2019 Journal code: 8214983. E-ISSN: 1096-0295. L-ISSN: 0273-2300.	The GHB614 x LLCotton25 x MON 15985 cotton stacked product was not included in this study.

Study (Author(s) and year)	Title	Source	Reason(s) for exclusion based on eligibility/inclusion criteria listed in Table 1
Hernandez-Teran, Alejandra. Wegier, Ana. Benitez, Mariana. Lira, Rafael. Sosa Fuentes, Tania Gabriela. Escalante, Ana E. 2019	<i>In vitro</i> performance in cotton plants with different genetic backgrounds: the case of <i>Gossypium hirsutum</i> in Mexico, and its implications for germplasm conservation.	PeerJ, (JUN 10 2019) Vol. 7, pp. Article No.: e7017. https://peerj.com/ . ISSN: 2167-8359. E-ISSN: 2167-8359.	The authors evaluated and compared <i>in vitro</i> performance of wild and domesticated cotton populations in Mexico and its relationship with transgenes (Cry1Ab/Ac, Cry2Ab and CP4EPSPS). The study was not related to the ERA of GHB614 x LLCotton25 x MON 15985 cotton stacked product.
Naegeli, H. Bresson. J. L. Dalmay, T. Dewhurst, I. C. Epstein, M. M. Firbank, L. G. Guerche, P. Hejatko, J. Moreno, F. J. Mullins, E. Nogue, F. Rostoks, N. Serrano, J. J. S. Savoini, G. Veromann, E. Veronesi, F. Alvarez, F. Ardizzzone, M. Raffaello, T. 2021	Assessment of genetically modified cotton GHB614 for renewal authorisation under regulation (EC) No 1829/2003 (application EFSA-GMO -RX-018).	EFSA Journal (2021), Volume 19, Number 7, 10 refs. ISSN: 1831-4732 DOI: https://doi.org/10.2903/j.efsa.a.2021.6671 Published by: Wiley, Oxford	The assessment was done for GHB614 cotton and not for the GHB614 x LLCotton25 x MON 15985 cotton stacked product.
Pan, Xiaoping. 2019	Determining pollen-mediated gene flow in transgenic cotton.	Methods in Molecular Biology (New York, NY, United States) (2019), 1902(Transgenic Cotton), 309-321 CODEN: MMBIED; ISSN: 1940-6029	The author used transgenic IR and HT cotton as two examples to present a field practice method for determining transgene flow in cotton. The study does not present primary data and is not related to the ERA of GHB614 x LLCotton25 x MON 15985 cotton.

Study (Author(s) and year)	Title	Source	Reason(s) for exclusion based on eligibility/inclusion criteria listed in Table 1
Singh, Monika. Randhawa, Gurinderjit. Bhoge, Rajesh K. Singh, Sushmita. Kak, Anjali. Sangwan, Omender 2020	Monitoring adventitious presence of transgenes in cotton collections from Genebank and experimental plots: ensuring GM-free conservation and cultivation of genetic resources.	Agricultural Research (2020), Volume 9, Number 4, pp. 469-476, 25 refs. ISSN: 2249-720X DOI: 10.1007/s40003-019-00449-z Published by: Spriner (India) Private Limited, New Delhi	The authors used PCR for checking adventitious presence of transgenes in a set of 100 accessions of <i>ex situ</i> cotton collection being conserved in the National Genebank of India. Adventitious presence of transgenes was also monitored in 50 samples collected from experimental plots, growing adjacent to Bt cotton, using molecular markers for specific GM cotton (MON 15985). The study was not related to the ERA of GHB614 x LLCotton25 x MON 15985 cotton stacked product.

Table 10: Report of unobtainable/unclear publications

Study (Author(s) and year)	Title	Source	Description of (unsuccessful) methods used to try and obtain a copy of the publication
No publications in this category.			

6. NARRATIVE SYNTHESIS/SUMMARY OF RELEVANT STUDIES

A total of 55 publications were selected during Stage 1 evaluation (rapid assessment based on title and abstract). After Stage 2 evaluation (detailed review based on full text), it was determined that no publications were relevant for the safety assessment of the GHB614 x LLCotton25 x MON 15985 cotton stack and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2.

7. CONCLUSION

The literature searches performed for the GHB614 x LLCotton25 x MON 15985 cotton stack and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2, for the period from August 1, 2020 to September 30, 2021, identified a total of 55 unique publications (after duplicate removal). A total of five publications were progressed for detailed assessment after excluding 50 obviously irrelevant publications during Stage 1 evaluation (rapid assessment based on title and abstract).

The five publications that progressed to the detailed assessment were evaluated in detail, based on full text, for potential relevance, following the pre-established criteria listed in [Table 1](#). No new publications were found that contained new data on the molecular characterization of the GHB614 x LLCotton25 x MON 15985 cotton and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2. Similarly, no new publications were found that suggested any potential adverse effects of GHB614 x LLCotton25 x MON 15985 cotton on human health, animal health, or the environment. No issues or topics were identified that would trigger or warrant more specific question formulation or indicate that a systematic review would be of value.

8. REFERENCES

No.	Author(s), title, source, edition, year, pages
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- | | |
|----|---|
| 1. | Devos Y, Guajardo IM, Alvarez F and Glanville J. 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 publications 2019:EN-1614. 62 pages. doi:10.2903/sp.efsa.2019.EN-1614. |
|----|---|

9. APPENDICES

Appendix 1 Database descriptions

Host	File	Description
STN	AGRICOLA	<p>Agriculture Online Access is a bibliographic database containing selected worldwide literature of agriculture and related fields. AGRICOLA is the locator and bibliographic access and control system of the National Agricultural Library (NAL) collections and also includes records from other cooperating institutions. Coverage of the database includes agricultural economics and rural sociology, agricultural production, animal sciences, chemistry, entomology, food and human nutrition, forestry, natural resources, pesticides, plant science, soils and fertilizers, and water resources. Also covered are related areas such as biology and biotechnology, botany, ecology, and natural history.</p> <p>The database draws on bibliographies, serial articles, book chapters, monographs, computer files, serials, maps, audiovisuals, and reports. Bibliographic information, abstracts, geographic terms, controlled terms, and supplementary terms are searchable.</p>
STN	BIOSIS	<p>BIOSIS Previews® is the largest and most comprehensive life science database in the world. Amongst others subject coverage includes Agriculture, Biochemistry, Biophysics, Botany, Environmental Biology, Physiology, Toxicology.</p> <p>Sources include periodicals, journals, conference proceedings, reviews, reports, patents, and short communications. Nearly 6,000 life source journals, 1,500 international meetings as well as review articles, books, and monographs are reviewed for inclusion.</p> <p>Bibliographic information, indexing terms, abstracts, and CAS Registry Numbers are all searchable.</p>
STN	CABA/CAB	<p>The CAB Abstracts database covers worldwide literature from all areas of agriculture and related sciences including Agriculture, Agricultural chemicals, Animal sciences and production, Crop protection, Crop sciences and production, Environment, Soils and fertilizers.</p> <p>Sources for CABA include journals, books, reports, published theses, conference proceedings, and patents.</p> <p>Bibliographic information, indexing terms, abstracts, and CAS Registry Numbers are searchable.</p>
STN	CAS-CA/CAPLUS	<p>The Chemical Abstracts (CA) database covers all areas of Biochemistry, Chemistry and Chemical engineering, and related sciences.</p> <p>Sources include over 8,000 journals, patents from 38 national patent offices and two international patent organizations, technical reports, books, conference proceedings, and dissertations. Electronic only journals and Web preprints are also covered.</p> <p>Bibliographic terms, indexing terms, roles, CAS Registry Numbers, International Patent Classification, and abstracts are searchable.</p>

Host	File	Description
STN	MEDLINE	<p>MEDLINE contains information on every area of medicine. The MEDLINE database corresponds to Index Medicus, Index to Dental Literature, and International Nursing Index; OLDMEDLINE, with data from NLM's from the Cumulated Index Medicus (1960-1965) and Current List of Medical Literature (1958-1959); and, since August 2001, IN-PROCESS records, the latest documents before they have been completely indexed for inclusion on MEDLINE.</p> <p>Sources include journals and chapters in books or symposia. Bibliographic information, indexing terms, abstracts, chemical names, and CAS Registry Numbers are all searchable.</p> <p>Online thesauri are available for the Medical Subject Headings (/MN), Controlled Terms (/CT) and Chemical Name (/CN) fields.</p>

Appendix 2 Search history

FILE 'MEDLINE' ENTERED AT 14:17:11 ON 22 OCT 2021

L1 4 SEA GHB614 OR GHB(W)614 OR BCS-GH002-5 OR BCSGH002-5 OR BCS(W)GH002(W)5 OR BCSGH002(W)5 OR BCS-GH002-5 OR BCS(W)GH002(W)5 OR BCSGH002(W)5

L2 0 SEA GHB614X OR GHB(W)614X OR BCS-GH002-5X OR BCSGH002-5X OR BCS(W)GH002(W)5X OR BCSGH002(W)5X OR BCS-GH002-5X OR BCS(W)GH002(W)5X OR BCSGH002(W)5X

L3 4 SEA (L1 OR L2)

L4 3 SEA LLCOTTON25 OR LLCOTTON(W)25 OR LL(W)COTTON25 OR LL(W)COTTON(W)25 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3

L5 0 SEA LLCOTTON25X OR LLCOTTON(W)25X OR LL(W)COTTON25X OR LL(W)COTTON(W)25X OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X

L6 0 SEA XLLCOTTON25 OR XLLCOTTON(W)25 OR XLL(W)COTTON25 OR XLL(W)COTTON(W)25 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3

L7 0 SEA XLLCOTTON25X OR XLLCOTTON(W)25X OR XLL(W)COTTON25X OR XLL(W)COTTON(W)25X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X

L8 3 SEA (L4 OR L5 OR L6 OR L7)

L9 12 SEA MON(W)15985 OR MON15985 OR MON-15985-7 OR MON(W)15985(W)7 OR MON15985(W)7 OR XMON(W)15985 OR XMON15985 OR XMON-15985-7 OR XMON(W)15985(W)7 OR XMON15985(W)7

L10 0 SEA GHB614XLLCOTTON25XMON15985 OR GHB(W)614XLLCOTTON25XMON15985 OR GHB614XLL(W)COTTON25XMON15985 OR GHB614XLLCOTTON(W)25XMON15985 OR GHB614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON25XMON15985 OR GHB(W)614XLLCOTTON(W)25XMON15985

L11 1 SEA GHB(W)614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON(W)25XMON15985 OR GHB(W)614XLL(W)COTTON25XMON(W)15986 OR GHB(W)614XLL(W)COTTON(W)25XMON(W)15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME#(W)MON(W)15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME#(W)MON(W)15985

L12 1 SEA (L10 OR L11)

L13 1 SEA (L3 AND L8) OR (L3 AND L9) OR (L8 AND L9) OR L12

L14 2 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR GLY(W)TOLTM? OR GLY(W)TOLRTM?

L15 71 SEA BOLLGARD? OR BOLGARD?

L16 18 SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM

L17 0 SEA (L14 AND L15) OR (L14 AND L16) OR (L15 AND L16)

L18 14 SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS

L19 4218 SEA EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOYLPYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC)(4W)(PHOSPHATE OR PHOSPHORIC)(2W)(SYNTHASE OR SYNTHETASE)

L20 0 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL)(W)(PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE)(2W)(SYNTHASE OR SYNTHETASE)

L21 382 SEA (ENOL(W)PYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W)(PYRUVYL OR PYRUVOYL)(W)SHIKIMATE)(3W)PHOSPHATE(W)(SYNTHASE OR SYNTHETASE)

L22 482 SEA (PHOSPHOSHIKIMATE(2W)CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE(2W)CARBOXYVINYL(W)TRANSFERASE OR ENOLPYRUVOYL(W)SHIKIMIC(3W)PHOSPHOSYNTHASE)

L23 24435 SEA ((DOUBL# OR DOBL#)(W)(MUTANT# OR MUTAT?) OR 2M)

L24 20 SEA L18 OR ((L19 OR L20 OR L21 OR L22))(S)L23)

L25 1464 SEA ((BAR OR PAT)(2A)(GENE# OR PROTEIN# OR ENZYME#)) OR

L26 203 PPT (2W) ACETYLTRANSFERASE OR PPT (2W) ACETYL (W) TRANSFERASE OR PT (W) N (2W) ACETYLTRANSFERASE OR PT (W) N (2W) ACETYL (W) TRANSFERASE
SEA PHOSPHINOTHRICIN (W) N (W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN (2W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN (W) TRANSFERASE
L27 1538 SEA (L25 OR L26)
L28 1186 SEA CRY1AC# OR CRY (W) 1 (W) AC# OR CRY (W) 1AC# OR CRY1 (W) AC# OR CRY1 (W) A (W) C# OR CRY (W) 1 (W) A (W) C# OR CRY1A (W) C#
L29 127 SEA CRYIAC# OR CRY (W) I (W) AC# OR CRY (W) IAC# OR CRYI (W) AC# OR CRYI (W) A (W) C# OR CRY (W) I (W) A (W) C# OR CRYIA (W) C#
L30 59 SEA CRYLAC# OR CRY (W) L (W) AC# OR CRY (W) LAC# OR CRYL (W) AC# OR CRYL (W) A (W) C# OR CRY (W) L (W) A (W) C# OR CRYLA (W) C#
L31 85 SEA CRY2AB2 OR CRY (W) 2AB2 CRY2 (W) AB2 OR CRY2A (W) B2 OR CRY2AB (W) 2 OR CRY2 (W) AB (W) 2 OR CRY (W) 2 (W) AB2 OR CRY (W) 2 (W) A (W) B2 OR CRYIIAB2 OR CRY (W) IIAB2 CRYII (W) AB2 OR CRYIIA (W) B2 OR CRYIIAB (W) 2 OR CRYII (W) AB (W) 2 OR CRY (W) II (W) AB2 OR CRY (W) II (W) A (W) B2
L32 1394 SEA (L28 OR L29 OR L30 OR L31)
L33 23 SEA (L24 AND L27) OR (L24 AND L32) OR (L27 AND L32)
L34 3527 SEA (HERBICID? OR GL!PHOSATE# OR GL!FOSATE# OR G360 OR G (W) 360 OR ROUNDUP? OR ROUND (W) UP?) (5A) (RESIST? OR TOLERAN? OR PROTECT?)
L35 3354 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR PROTECT? OR TOLERAN?)
L36 208336 SEA INSECT# OR PEST# OR LEPIDOPTERA# OR NOCTUIDAE OR CRAMBIDAE OR BORER# OR CORNBORER# OR STALKBORER# OR EARWORM# OR EAR (W) WORM# OR ARMYWORM# OR ARMY (W) WORM# OR CUTWORM# OR CUT (W) WORM# OR OSTRINIA OR O (W) NUBILALIS OR SESAMIA OR S (W) NONAGRIODES
L37 14040 SEA DIATRAEA OR D (W) GRANDIOSELLA OR D (W) CRAMBIDOIDES OR HELICOVERPA OR H (W) ZEA OR SPODOPTERA OR S (W) FRUGIPERDA OR PAPAIPEMA OR P (W) NEBRIS OR ELASMOPALPUS OR E (W) LIGNOSELLUS OR D (W) SACCHARALIS OR STRIACOSTA OR S (W) ALBICOSTA
L38 22853 SEA AGROTIS OR A (W) IPSILON OR S (W) CRETICA OR MYTHIMNA OR M (W) UNIPUNCTA OR ECB OR MCB OR SWCB OR SCSB OR CEW OR FAW OR SCB OR WBC
L39 2411294 SEA (RESIST? OR PROTECT? OR TOLERAN?)
L40 8488 SEA ((L36 OR L37 OR L38)) (5A) L39
L41 3110 SEA (L34 AND L35) OR (L34 AND L40) OR (L35 AND L40)
L42 26920 SEA COTTON# OR GOSSYPIMUM OR G (W) HIRSUTUM OR G (W) BARBADENSE
L43 3826556 SEA GMO OR GMOS OR LMO OR LMOS OR GM OR GE OR TRANSGEN? OR (GENETIC? (3A) (MODIF? OR TRANSFORM? OR MANIPULAT? OR IMPROV? OR ENGINEER?))
L44 111 SEA L41 AND L42 AND L43
L45 134 SEA L13 OR L17 OR L33 OR L44
L46 17 SEA L45 AND PY>=2019
L47 7 SEA L46 AND UP>=20200801 AND UP<=20210930

FILE 'BIOSIS' ENTERED AT 14:18:39 ON 22 OCT 2021
L48 4 SEA GHB614 OR GHB (W) 614 OR BCS-GH002-5 OR BCSGH002-5 OR BCS (W) GH002 (W) 5 OR BCSGH002 (W) 5 OR BCS-GH002-5 OR BCS (W) GH002 (W) 5 OR BCSGH002 (W) 5
L49 0 SEA GHB614X OR GHB (W) 614X OR BCS-GH002-5X OR BCSGH002-5X OR BCS (W) GH002 (W) 5X OR BCSGH002 (W) 5X OR BCS-GH002-5X OR BCS (W) GH002 (W) 5X OR BCSGH002 (W) 5X
L50 4 SEA (L48 OR L49)
L51 4 SEA LLCOTTON25 OR LLCOTTON (W) 25 OR LL (W) COTTON25 OR LL (W) COTTON (W) 25 OR ACS-GH001-3 OR ACS (W) GH001 (W) 3 OR ACSGH001 (W) 3 OR ACS-GH001-3 OR ACS (W) GH001 (W) 3 OR ACSGH001 (W) 3
L52 0 SEA LLCOTTON25X OR LLCOTTON (W) 25X OR LL (W) COTTON25X OR LL (W) COTTON (W) 25X OR ACS-GH001-3X OR ACS (W) GH001 (W) 3X OR ACSGH001 (W) 3X OR ACS-GH001-3X OR ACS (W) GH001 (W) 3X OR ACSGH001 (W) 3X
L53 0 SEA XLLCOTTON25 OR XLLCOTTON (W) 25 OR XLL (W) COTTON25 OR

		XLL(W)COTTON(W)25 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3
L54	0	SEA XLLCOTTON25X OR XLLCOTTON(W)25X OR XLL(W)COTTON25X OR XLL(W)COTTON(W)25X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X
L55	4	SEA (L51 OR L52 OR L53 OR L54)
L56	14	SEA MON(W)15985 OR MON15985 OR MON-15985-7 OR MON(W)15985(W)7 OR MON15985(W)7 OR XMON(W)15985 OR XMON15985 OR XMON-15985-7 OR XMON(W)15985(W)7 OR XMON15985(W)7
L57	0	SEA GHB614XLLCOTTON25XMON15985 OR GHB(W)614XLLCOTTON25XMON15985 OR GHB614XLL(W)COTTON25XMON15985 OR GHB614XLLCOTTON(W)25XMON15985 OR GHB614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON25XMON15985 OR GHB(W)614XLLCOTTON(W)25XMON15985
L58	0	SEA GHB(W)614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON(W)25XMON15985 OR GHB(W)614XLL(W)COTTON25XMON(W)15986 OR GHB(W)614XLL(W)COTTON(W)25XMON(W)15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME#(W)MON15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME#(W)MON(W)15985
L59	0	SEA (L57 OR L58)
L60	1	SEA (L50 AND L55) OR (L50 AND L56) OR (L55 AND L56) OR L59
L61	6	SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR GLY(W)TOLTM? OR GLY(W)TOLRTM?
L62	209	SEA BOLLGARD? OR BOLGARD?
L63	46	SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM
L64	3	SEA (L61 AND L62) OR (L61 AND L63) OR (L62 AND L63)
L65	12	SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS
L66	5038	SEA EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYOYLSHIKIMATE OR ENOYLPYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4W) (PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE)
L67	0	SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE)
L68	720	SEA (ENOL(W)PYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W)SHIKIMATE) (3W)PHOSPHATE(W) (SYNTHASE OR SYNTHETASE)
L69	27	SEA (PHOSPHOSHIKIMATE(2W)CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE(2W)CARBOXYVINYL(W)TRANSFERASE OR ENOLPYRUVOYL(W)SHIKIMIC(3W)PHOSPHOSYNTHASE)
L70	26907	SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)
L71	19	SEA L65 OR ((L66 OR L67 OR L68 OR L69)) (S)L70)
L72	2842	SEA ((BAR OR PAT) (2A) (GENE# OR PROTEIN# OR ENZYME#)) OR PPT(2W)ACETYLTRANSFERASE OR PPT(2W)ACETYL(W)TRANSFERASE OR PT(W)N(2W)ACETYLTRANSFERASE OR PT(W)N(2W)ACETYL(W)TRANSFERASE
L73	332	SEA PHOSPHINOTHRICIN(W)N(W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYL(W)TRANSFERASE OR PHOSPHINOTHRICINACETYL(W)TRANSFERASE
L74	2944	SEA (L72 OR L73)
L75	1931	SEA CRY1AC# OR CRY(W)1(W)AC# OR CRY(W)1AC# OR CRY1(W)AC# OR CRY1(W)A(W)C# OR CRY(W)1(W)A(W)C# OR CRY1A(W)C#
L76	231	SEA CRYIAC# OR CRY(W)I(W)AC# OR CRY(W)IAC# OR CRYI(W)AC# OR CRYI(W)A(W)C# OR CRY(W)I(W)A(W)C# OR CRYIA(W)C#
L77	367	SEA CRYLAC# OR CRY(W)L(W)AC# OR CRY(W)LAC# OR CRYL(W)AC# OR CRYL(W)A(W)C# OR CRY(W)L(W)A(W)C# OR CRYLA(W)C#
L78	118	SEA CRY2AB2 OR CRY(W)2AB2 CRY2(W)AB2 OR CRY2A(W)B2 OR CRY2AB(W)2 OR CRY2(W)AB(W)2 OR CRY(W)2(W)AB2 OR CRY(W)2(W)A(W)B2 OR CRYIIAB2 OR CRY(W)IIAB2 CRYII(W)AB2 OR CRYIIA(W)B2 OR CRYIIAB(W)2 OR CRYII(W)AB(W)2 OR CRY(W)II(W)AB2 OR CRY(W)II(W)A(W)B2
L79	2284	SEA (L75 OR L76 OR L77 OR L78)
L80	43	SEA (L71 AND L74) OR (L71 AND L79) OR (L74 AND L79)

L81 11075 SEA (HERBICID? OR GL!PHOSATE# OR GL!FOSATE# OR G360 OR G(W)360 OR ROUNDUP? OR ROUND(W)UP?) (5A) (RESIST? OR TOLERAN? OR PROTECT?)

L82 9919 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR PROTECT? OR TOLERAN?)

L83 1426235 SEA INSECT# OR PEST# OR LEPIDOPTERA# OR NOCTUIDAE OR CRAMBIDAE OR BORER# OR CORNBORER# OR STALKBORER# OR EARWORM# OR EAR(W)WORM# OR ARMYWORM# OR ARMY(W)WORM# OR CUTWORM# OR CUT(W)WORM# OR OSTRINIA OR O(W)NUBILALIS OR SESAMIA OR S(W)NONAGRIODES

L84 27374 SEA DIATRAEA OR D(W)GRANDIOSELLA OR D(W)CRAMBIDOIDES OR HELICOVERPA OR H(W)ZEA OR SPODOPTERA OR S(W)FRUGIPERDA OR PAPAIPEMA OR P(W)NEBRIS OR ELASMOPALPUS OR E(W)LIGNOSELLUS OR D(W)SACCHARALIS OR STRIACOSTA OR S(W)ALBICOSTA

L85 32979 SEA AGROTIS OR A(W)IPSILON OR S(W)CRETICA OR MYTHIMNA OR M(W)UNIPUNCTA OR ECB OR MCB OR SWCB OR SCSB OR CEW OR FAW OR SCB OR WBC

L86 2417344 SEA (RESIST? OR PROTECT? OR TOLERAN?)

L87 24793 SEA ((L83 OR L84 OR L85)) (5A)L86

L88 9568 SEA (L81 AND L82) OR (L81 AND L87) OR (L82 AND L87)

L89 75373 SEA COTTON# OR GOSSYPIMUM OR G(W)HIRSUTUM OR G(W)BARBADENSE

L90 466790 SEA GMO OR GMOS OR LMO OR LMOS OR GM OR GE OR TRANSGEN? OR (GENETIC?(3A) (MODIF? OR TRANSFORM? OR MANIPULAT? OR IMPROV? OR ENGINEER?))

L91 255 SEA L88 AND L89 AND L90

L92 302 SEA L60 OR L64 OR L80 OR L91

L93 28 SEA L92 AND PY>=2019

L94 16 SEA L93 AND UP>=20200801 AND UP<=20210930

FILE 'AGRICOLA' ENTERED AT 14:20:06 ON 22 OCT 2021

L95 2 SEA GHB614 OR GHB(W)614 OR BCS-GH002-5 OR BCSGH002-5 OR BCS(W)GH002(W)5 OR BCSGH002(W)5 OR BCS-GH002-5 OR BCS(W)GH002(W)5 OR BCSGH002(W)5

L96 0 SEA GHB614X OR GHB(W)614X OR BCS-GH002-5X OR BCSGH002-5X OR BCS(W)GH002(W)5X OR BCSGH002(W)5X OR BCS-GH002-5X OR BCS(W)GH002(W)5X OR BCSGH002(W)5X

L97 2 SEA (L95 OR L96)

L98 2 SEA LLCOTTON25 OR LLCOTTON(W)25 OR LL(W)COTTON25 OR LL(W)COTTON(W)25 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3

L99 0 SEA LLCOTTON25X OR LLCOTTON(W)25X OR LL(W)COTTON25X OR LL(W)COTTON(W)25X OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X

L100 0 SEA XLLCOTTON25 OR XLLCOTTON(W)25 OR XLL(W)COTTON25 OR XLL(W)COTTON(W)25 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3

L101 0 SEA XLLCOTTON25X OR XLLCOTTON(W)25X OR XLL(W)COTTON25X OR XLL(W)COTTON(W)25X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X

L102 2 SEA (L98 OR L99 OR L100 OR L101)

L103 9 SEA MON(W)15985 OR MON15985 OR MON-15985-7 OR MON(W)15985(W)7 OR MON15985(W)7 OR XMON(W)15985 OR XMON15985 OR XMON-15985-7 OR XMON(W)15985(W)7 OR XMON15985(W)7

L104 0 SEA GHB614XLLCOTTON25XMON15985 OR GHB(W)614XLLCOTTON25XMON15985 OR GHB614XLL(W)COTTON25XMON15985 OR GHB614XLLCOTTON(W)25XMON15985 OR GHB(W)614XLL(W)COTTON25XMON15985 OR GHB(W)614XLLCOTTON(W)25XMON15985

L105 0 SEA GHB(W)614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON(W)25XMON15985 OR GHB(W)614XLL(W)COTTON25XMON(W)15986 OR GHB(W)614XLL(W)COTTON(W)25XMON(W)15985 OR GHB614(W)TIME#(W)LLCO

TTON25 (W) TIME# (W) MON15985 OR GHB614 (W) TIME# (W) LLCOTTON25 (W) TIME
(W) MON (W) 15985

L106 0 SEA (L104 OR L105)

L107 0 SEA (L97 AND L102) OR (L97 AND L103) OR (L102 AND L103) OR
L106

L108 3 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR
GLY(W)TOLTM? OR GLY(W)TOLRTM?

L109 199 SEA BOLLGARD? OR BOLGARD?

L110 41 SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)
)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM

L111 3 SEA (L108 AND L109) OR (L108 AND L110) OR (L109 AND L110)

L112 4 SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS

L113 653 SEA EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR
ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUV
OYLSHIKIMATE OR ENOYLPRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4W)
(PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE)

L114 0 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKI
MATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (S
YNTHASE OR SYNTHETASE)

L115 307 SEA (ENOL(W)PYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR
ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE
) (3W) PHOSPHATE (W) (SYNTHASE OR SYNTHETASE)

L116 238 SEA (PHOSPHOSHIKIMATE (2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIK
IMATE (2W) CARBOXYVINYL (W) TRANSFERASE OR ENOLPYRUVOYL (W) SHIKIMIC (3W)
PHOSPHOSYNTHASE)

L117 6578 SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)

L118 9 SEA L112 OR ((L113 OR L114 OR L115 OR L116)) (S) L117)

L119 779 SEA ((BAR OR PAT) (2A) (GENE# OR PROTEIN# OR ENZYME#)) OR
PPT (2W) ACETYLTRANSFERASE OR PPT (2W) ACETYL (W) TRANSFERASE OR
PT (W) N (2W) ACETYLTRANSFERASE OR PT (W) N (2W) ACETYL (W) TRANSFERASE

L120 252 SEA PHOSPHINOTHRICIN (W) N (W) ACETYLTRANSFERASE OR PHOSPHINOTHRICI
N (2W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN (2W) ACETYL (W) TRANSFER
ASE OR PHOSPHINOTHRICINACETYL (W) TRANSFERASE

L121 858 SEA (L119 OR L120)

L122 1148 SEA CRY1AC# OR CRY(W)1(W)AC# OR CRY(W)1AC# OR CRY1(W)AC# OR
CRY1(W)A(W)C# OR CRY(W)1(W)A(W)C# OR CRY1A(W)C#

L123 150 SEA CRYIAC# OR CRY(W)I(W)AC# OR CRY(W)IAC# OR CRYI(W)AC# OR
CRYI(W)A(W)C# OR CRY(W)I(W)A(W)C# OR CRYIA(W)C#

L124 24 SEA CRYLAC# OR CRY(W)L(W)AC# OR CRY(W)LAC# OR CRYL(W)AC# OR
CRYL(W)A(W)C# OR CRY(W)L(W)A(W)C# OR CRYLA(W)C#

L125 81 SEA CRY2AB2 OR CRY(W)2AB2 CRY2(W)AB2 OR CRY2A(W)B2 OR CRY2AB(W)
2 OR CRY2(W)AB(W)2 OR CRY(W)2(W)AB2 OR CRY(W)2(W)A(W)B2 OR CRYIIAB2
OR CRY(W)IIAB2 CRYII(W)AB2 OR CRYII(W)B2 OR CRYIIA(W)B2 OR CRYIIAB(W)
)2 OR CRYII(W)AB(W)2 OR CRY(W)II(W)AB2 OR CRY(W)II(W)A(W)B2

L126 1355 SEA (L122 OR L123 OR L124 OR L125)

L127 20 SEA (L118 AND L121) OR (L118 AND L126) OR (L121 AND L126)

L128 8637 SEA (HERBICID? OR GL!PHOSATE# OR GL!FOSATE# OR G360 OR G(W)360
OR ROUNDUP? OR ROUND(W)UP?) (5A) (RESIST? OR TOLERAN? OR
PROTECT?)

L129 8217 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR
GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR
PROTECT? OR TOLERAN?)

L130 337276 SEA INSECT# OR PEST# OR LEPIDOPTERA# OR NOCTUIDAE OR CRAMBIDAE
OR BORER# OR CORNBORER# OR STALKBORER# OR EARWORM# OR EAR(W)WORM#
OR ARMYWORM# OR ARMY(W)WORM# OR CUTWORM# OR CUT(W)WORM# OR
OSTRINIA OR O(W)NUBILALIS OR SESAMIA OR S(W)NONAGRIOIDES

L131 14234 SEA DIATRAEA OR D(W)GRANDIOSELLA OR D(W)CRAMBIDOIDES OR
HELICOVERPA OR H(W)ZEA OR SPODOPTERA OR S(W)FRUGIPERDA OR
PAPAIPEMA OR P(W)NEBRIS OR ELASMOPALPUS OR E(W)LIGNOSELLUS OR
D(W)SACCHARALIS OR STRIACOSTA OR S(W)ALBICOSTA

L132 4888 SEA AGROTIS OR A(W)IPSILON OR S(W)CRETICA OR MYTHIMNA OR
M(W)UNIPUNCTA OR ECB OR MCB OR SWCB OR SCSB OR CEW OR FAW OR
SCB OR WBC

L133 622092 SEA (RESIST? OR PROTECT? OR TOLERAN?)
L134 21803 SEA ((L130 OR L131 OR L132)) (5A)L133
L135 8068 SEA (L128 AND L129) OR (L128 AND L134) OR (L129 AND L134)
L136 64263 SEA COTTON# OR GOSSYPIMUM OR G(W)HIRSUTUM OR G(W)BARBADENSE
L137 103308 SEA GMO OR GMOS OR LMO OR LMOS OR GM OR GE OR TRANSGEN? OR
(GENETIC?(3A) (MODIF? OR TRANSFORM? OR MANIPULAT? OR IMPROV? OR
ENGINEER?))
L138 226 SEA L135 AND L136 AND L137
L139 247 SEA L107 OR L111 OR L127 OR L138
L140 9 SEA L139 AND PY>=2019
L141 5 SEA L140 AND UP>=20200801 AND UP<=20210930

FILE 'CABA' ENTERED AT 14:22:08 ON 22 OCT 2021

L142 7 SEA GHB614 OR GHB(W) 614 OR BCS-GH002-5 OR BCSGH002-5 OR
BCS(W)GH002(W) 5 OR BCSGH002(W) 5 OR BCS-GH002-5 OR BCS(W)GH002(W)
5 OR BCSGH002(W) 5
L143 0 SEA GHB614X OR GHB(W) 614X OR BCS-GH002-5X OR BCSGH002-5X OR
BCS(W)GH002(W) 5X OR BCSGH002(W) 5X OR BCS-GH002-5X OR BCS(W)GH00
2(W) 5X OR BCSGH002(W) 5X
L144 7 SEA (L142 OR L143)
L145 5 SEA LLCOTTON25 OR LLCOTTON(W) 25 OR LL(W)COTTON25 OR LL(W)COTTON
(W) 25 OR ACS-GH001-3 OR ACS(W)GH001(W) 3 OR ACSGH001(W) 3 OR
ACSGH001-3 OR ACS(W)GH001(W) 3 OR ACSGH001(W) 3
L146 0 SEA LLCOTTON25X OR LLCOTTON(W) 25X OR LL(W)COTTON25X OR
LL(W)COTTON(W) 25X OR ACS-GH001-3X OR ACS(W)GH001(W) 3X OR
ACSGH001(W) 3X OR ACS-GH001-3X OR ACS(W)GH001(W) 3X OR ACSGH001(W)
3X
L147 0 SEA XLLCOTTON25 OR XLLCOTTON(W) 25 OR XLL(W)COTTON25 OR
XLL(W)COTTON(W) 25 OR XACS-GH001-3 OR XACS(W)GH001(W) 3 OR
XACSGH001(W) 3 OR XACS-GH001-3 OR XACS(W)GH001(W) 3 OR XACSGH001(W)
3
L148 0 SEA XLLCOTTON25X OR XLLCOTTON(W) 25X OR XLL(W)COTTON25X OR
XLL(W)COTTON(W) 25X OR XACS-GH001-3X OR XACS(W)GH001(W) 3X OR
XACSGH001(W) 3X OR XACS-GH001-3X OR XACS(W)GH001(W) 3X OR
XACSGH001(W) 3X
L149 5 SEA (L145 OR L146 OR L147 OR L148)
L150 18 SEA MON(W)15985 OR MON15985 OR MON-15985-7 OR MON(W)15985(W) 7
OR MON15985(W) 7 OR XMON(W)15985 OR XMON15985 OR XMON-15985-7
OR XMON(W)15985(W) 7 OR XMON15985(W) 7
L151 0 SEA GHB614XLLCOTTON25XMON15985 OR GHB(W) 614XLLCOTTON25XMON15985
OR GHB614XLL(W)COTTON25XMON15985 OR GHB614XLLCOTTON(W) 25XMON15
985 OR GHB614XLLCOTTON25XMON(W)15985 OR GHB(W) 614XLL(W)COTTON25
XMON15985 OR GHB(W) 614XLLCOTTON(W) 25XMON15985
L152 1 SEA GHB(W) 614XLLCOTTON25XMON(W)15985 OR GHB(W) 614XLL(W)COTTON(W)
) 25XMON15985 OR GHB(W) 614XLL(W)COTTON25XMON(W)15986 OR
GHB(W) 614XLL(W)COTTON(W) 25XMON(W)15985 OR GHB614(W)TIME#(W)LLCO
TTON25(W)TIME#(W)MON15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME
#(W)MON(W)15985
L153 1 SEA (L151 OR L152)
L154 2 SEA (L144 AND L149) OR (L144 AND L150) OR (L149 AND L150) OR
L153
L155 5 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR
GLY(W)TOLTM? OR GLY(W)TOLRTM?
L156 388 SEA BOLLGARD? OR BOLGARD?
L157 103 SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)
)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM
L158 6 SEA (L155 AND L156) OR (L155 AND L157) OR (L156 AND L157)
L159 14 SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS
L160 1124 SEA EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR
ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUV
OYLSHIKIMATE OR ENOYLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4W)
(PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE)
L161 0 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKI

MATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE)

L162 434 SEA (ENOL(W)PYRUVYLSHIKIMIC OR ENOLPYRUVYLSHIKIMIC OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE) (3W) PHOSPHATE (W) (SYNTHASE OR SYNTHETASE)

L163 173 SEA (PHOSPHOSHIKIMATE (2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE (2W) CARBOXYVINYL (W) TRANSFERASE OR ENOLPYRUVOYL (W) SHIKIMIC (3W) PHOSPHOSYNTHASE)

L164 7312 SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)

L165 21 SEA L159 OR ((L160 OR L161 OR L162 OR L163)) (S) L164)

L166 1541 SEA ((BAR OR PAT) (2A) (GENE# OR PROTEIN# OR ENZYME#)) OR PPT (2W) ACETYLTRANSFERASE OR PPT (2W) ACETYL (W) TRANSFERASE OR PT (W) N (2W) ACETYLTRANSFERASE OR PT (W) N (2W) ACETYL (W) TRANSFERASE

L167 378 SEA PHOSPHINOTHRICIN (W) N (W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN (2W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN (2W) ACETYL (W) TRANSFERASE OR PHOSPHINOTHRICINACETYL (W) TRANSFERASE

L168 1642 SEA (L166 OR L167)

L169 2118 SEA CRY1AC# OR CRY (W) 1 (W) AC# OR CRY (W) 1AC# OR CRY1 (W) AC# OR CRY1 (W) A (W) C# OR CRY (W) 1 (W) A (W) C# OR CRY1A (W) C#

L170 234 SEA CRYIAC# OR CRY (W) I (W) AC# OR CRY (W) IAC# OR CRYI (W) AC# OR CRYI (W) A (W) C# OR CRY (W) I (W) A (W) C# OR CRYIA (W) C#

L171 42 SEA CRYLAC# OR CRY (W) L (W) AC# OR CRY (W) LAC# OR CRYL (W) AC# OR CRYL (W) A (W) C# OR CRY (W) L (W) A (W) C# OR CRYLA (W) C#

L172 136 SEA CRY2AB2 OR CRY (W) 2AB2 CRY2 (W) AB2 OR CRY2A (W) B2 OR CRY2AB (W) 2 OR CRY2 (W) AB (W) 2 OR CRY (W) 2 (W) AB2 OR CRY (W) 2 (W) A (W) B2 OR CRYIIAB2 OR CRY (W) IIAB2 CRYII (W) AB2 OR CRYIIA (W) B2 OR CRYIIAB (W) 2 OR CRYII (W) AB (W) 2 OR CRY (W) II (W) AB2 OR CRY (W) II (W) A (W) B2

L173 2455 SEA (L169 OR L170 OR L171 OR L172)

L174 36 SEA (L165 AND L168) OR (L165 AND L173) OR (L168 AND L173)

L175 19084 SEA (HERBICID? OR GL!PHOSATE# OR GL!FOSATE# OR G360 OR G (W) 360 OR ROUNDUP? OR ROUND (W) UP?) (5A) (RESIST? OR TOLERAN? OR PROTECT?)

L176 18346 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR PROTECT? OR TOLERAN?)

L177 924432 SEA INSECT# OR PEST# OR LEPIDOPTERA# OR NOCTUIDAE OR CRAMBIDAE OR BORER# OR CORNBORER# OR STALKBORER# OR EARWORM# OR EAR (W) WORM# OR ARMYWORM# OR ARMY (W) WORM# OR CUTWORM# OR CUT (W) WORM# OR OSTRINIA OR O (W) NUBILALIS OR SESAMIA OR S (W) NONAGRIOIDES

L178 32689 SEA DIATRAEA OR D (W) GRANDIOSELLA OR D (W) CRAMBIDOIDES OR HELICOVERPA OR H (W) ZEA OR SPODOPTERA OR S (W) FRUGIPERDA OR PAPAIPEMA OR P (W) NEBRIS OR ELASMOPALPUS OR E (W) LIGNOSELLUS OR D (W) SACCHARALIS OR STRIACOSTA OR S (W) ALBICOSTA

L179 13296 SEA AGROTIS OR A (W) IPSILON OR S (W) CRETICA OR MYTHIMNA OR M (W) UNIPUNCTA OR ECB OR MCB OR SWCB OR SCSB OR CEW OR FAW OR SCB OR WBC

L180 1309755 SEA (RESIST? OR PROTECT? OR TOLERAN?)

L181 69414 SEA ((L177 OR L178 OR L179)) (5A) L180

L182 18021 SEA (L175 AND L176) OR (L175 AND L181) OR (L176 AND L181)

L183 96253 SEA COTTON# OR GOSSYPIUM OR G (W) HIRSUTUM OR G (W) BARBADENSE

L184 184977 SEA GMO OR GMOS OR LMO OR LMOS OR GM OR GE OR TRANSGEN? OR (GENETIC? (3A) (MODIF? OR TRANSFORM? OR MANIPULAT? OR IMPROV? OR ENGINEER?))

L185 497 SEA L182 AND L183 AND L184

L186 534 SEA L154 OR L158 OR L174 OR L185

L187 35 SEA L186 AND PY>=2019

L188 25 SEA L187 AND UP>=20200801 AND UP<=20210930

L189 25 SEA L188 NOT P/DT

L190 0 SEA L188 AND (P/DT AND J/DT)

L191 25 SEA L189 OR L190

FILE 'HCAPLUS' ENTERED AT 14:23:45 ON 22 OCT 2021

L192 7 SEA GHB614 OR GHB (W) 614 OR BCS-GH002-5 OR BCSGH002-5 OR

	BCS(W)GH002(W)5 OR BCSGH002(W)5 OR BCS-GH002-5 OR BCS(W)GH002(W)5 OR BCSGH002(W)5
L193	0 SEA GHB614X OR GHB(W)614X OR BCS-GH002-5X OR BCSGH002-5X OR BCS(W)GH002(W)5X OR BCSGH002(W)5X OR BCS-GH002-5X OR BCS(W)GH002(W)5X OR BCSGH002(W)5X
L194	7 SEA (L192 OR L193)
L195	9 SEA LLCOTTON25 OR LLCOTTON(W)25 OR LL(W)COTTON25 OR LL(W)COTTON(W)25 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3
L196	0 SEA LLCOTTON25X OR LLCOTTON(W)25X OR LL(W)COTTON25X OR LL(W)COTTON(W)25X OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X
L197	0 SEA XLLCOTTON25 OR XLLCOTTON(W)25 OR XLL(W)COTTON25 OR XLL(W)COTTON(W)25 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3
L198	0 SEA XLLCOTTON25X OR XLLCOTTON(W)25X OR XLL(W)COTTON25X OR XLL(W)COTTON(W)25X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X
L199	9 SEA (L195 OR L196 OR L197 OR L198)
L200	31 SEA MON(W)15985 OR MON15985 OR MON-15985-7 OR MON(W)15985(W)7 OR MON15985(W)7 OR XMON(W)15985 OR XMON15985 OR XMON-15985-7 OR XMON(W)15985(W)7 OR XMON15985(W)7
L201	0 SEA GHB614XLLCOTTON25XMON15985 OR GHB(W)614XLLCOTTON25XMON15985 OR GHB614XLL(W)COTTON25XMON15985 OR GHB614XLLCOTTON(W)25XMON15985 OR GHB614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON25XMON15985 OR GHB(W)614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON25XMON(W)15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME#(W)MON15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME#(W)MON(W)15985
L202	1 SEA GHB(W)614XLLCOTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON(W)25XMON15985 OR GHB(W)614XLL(W)COTTON25XMON(W)15985 OR GHB(W)614XLL(W)COTTON(W)25XMON(W)15985 OR GHB614(W)TIME#(W)LLCOTTON25(W)TIME#(W)MON(W)15985
L203	1 SEA (L201 OR L202)
L204	7 SEA (L194 AND L199) OR (L194 AND L200) OR (L199 AND L200) OR L203
L205	8 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR GLY(W)TOLTM? OR GLY(W)TOLRTM?
L206	184 SEA BOLLGARD? OR BOLGARD?
L207	52 SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM
L208	4 SEA (L205 AND L206) OR (L205 AND L207) OR (L206 AND L207)
L209	28 SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS
L210	4391 SEA EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYOYLSHIKIMATE OR ENOYLPYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4W) (PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE)
L211	9 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE)
L212	1076 SEA (ENOL(W)PYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE) (3W) PHOSPHATE(W) (SYNTHASE OR SYNTHETASE)
L213	83 SEA (PHOSPHOSHIKIMATE(2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE(2W) CARBOXYVINYL(W) TRANSFERASE OR ENOLPYRUVOYL(W) SHIKIMIC(3W) PHOSPHOSYNTHASE)
L214	74666 SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)
L215	40 SEA L209 OR (((L210 OR L211 OR L212 OR L213)) (S) L214)
L216	5215 SEA ((BAR OR PAT) (2A) (GENE# OR PROTEIN# OR ENZYME#)) OR PPT(2W) ACETYLTRANSFERASE OR PPT(2W) ACETYL(W) TRANSFERASE OR PT(W)N(2W) ACETYLTRANSFERASE OR PT(W)N(2W) ACETYL(W) TRANSFERASE
L217	783 SEA PHOSPHINOTHRICIN(W)N(W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN

N(2W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYL(W)TRANSFERASE OR PHOSPHINOTHRICINACETYL(W)TRANSFERASE

L218 5515 SEA (L216 OR L217)

L219 2282 SEA CRY1AC# OR CRY(W)1(W)AC# OR CRY(W)1AC# OR CRY1(W)AC# OR CRY1(W)A(W)C# OR CRY(W)1(W)A(W)C# OR CRY1A(W)C#

L220 1853 SEA CRYIAC# OR CRY(W)I(W)AC# OR CRY(W)IAC# OR CRYI(W)AC# OR CRYI(W)A(W)C# OR CRY(W)I(W)A(W)C# OR CRYIA(W)C#

L221 74 SEA CRYLAC# OR CRY(W)L(W)AC# OR CRY(W)LAC# OR CRYL(W)AC# OR CRYL(W)A(W)C# OR CRY(W)L(W)A(W)C# OR CRYLA(W)C#

L222 138 SEA CRY2AB2 OR CRY(W)2AB2 CRY2(W)AB2 OR CRY2A(W)B2 OR CRY2AB(W)2 OR CRY2(W)AB(W)2 OR CRY(W)2(W)AB2 OR CRY(W)2(W)A(W)B2 OR CRYIIAB2 OR CRY(W)IIAB2 CRYII(W)AB2 OR CRYIIA(W)B2 OR CRYIIAB(W)2 OR CRYII(W)AB(W)2 OR CRY(W)II(W)AB2 OR CRY(W)II(W)A(W)B2

L223 3042 SEA (L219 OR L220 OR L221 OR L222)

L224 3 SEA (L205 AND L208) OR (L205 AND L213) OR (L208 AND L213)

L225 29075 SEA (HERBICID? OR GL!PHOSATE# OR GL!FOSATE# OR G360 OR G(W)360 OR ROUNDUP? OR ROUND(W)UP?) (5A) (RESIST? OR TOLERAN? OR PROTECT?)

L226 28014 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR PROTECT? OR TOLERAN?)

L227 310324 SEA INSECT# OR PEST# OR LEPIDOPTERA# OR NOCTUIDAE OR CRAMBIDAE OR BORER# OR CORNBORER# OR STALKBORER# OR EARWORM# OR EAR(W)WORM# OR ARMYWORM# OR ARMY(W)WORM# OR CUTWORM# OR CUT(W)WORM# OR OSTRINIA OR O(W)NUBILALIS OR SESAMIA OR S(W)NONAGRIOIDES

L228 23084 SEA DIATRAEA OR D(W)GRANDIOSELLA OR D(W)CRAMBIDOIDES OR HELICOVERPA OR H(W)ZEA OR SPODOPTERA OR S(W)FRUGIPERDA OR PAPAPEMA OR P(W)NEBRIS OR ELASMOPALPUS OR E(W)LIGNOSELLUS OR D(W)SACCHARALIS OR STRIACOSTA OR S(W)ALBICOSTA

L229 24213 SEA AGROTIS OR A(W)IPSILOIN OR S(W)CRETICA OR MYTHIMNA OR M(W)UNIPUNCTA OR ECB OR MCB OR SWCB OR SCSB OR CEW OR FAW OR SCB OR WBC

L230 5867559 SEA (RESIST? OR PROTECT? OR TOLERAN?)

L231 39962 SEA ((L227 OR L228 OR L229)) (5A)L230

L232 27587 SEA (L225 AND L226) OR (L225 AND L231) OR (L226 AND L231)

L233 266523 SEA COTTON# OR GOSSYPIMUM OR G(W)HIRSUTUM OR G(W)BARBADENSE

L234 693490 SEA GMO OR GMOS OR LMO OR LMOS OR GM OR GE OR TRANSGEN? OR (GENETIC?(3A) (MODIF? OR TRANSFORM? OR MANIPULAT? OR IMPROV? OR ENGINEER?))

L235 1310 SEA L232 AND L233 AND L234

L236 1316 SEA L204 OR L208 OR L224 OR L235

L237 426 SEA L236 AND PY>=2019

L238 64 SEA L237 AND UP>=20200801 AND UP<=20210930

L239 10 SEA L238 NOT P/DT

L240 0 SEA L238 AND (P/DT AND J/DT)

L241 10 SEA L239 OR L240

FILE 'MEDLINE, BIOSIS, AGRICOLA, CABA, HCAPLUS' ENTERED AT 14:25:23 ON 22 OCT 2021

L242 55 DUP REM L47 L94 L141 L191 L241 (8 DUPLICATES REMOVED)
ANSWERS '1-7' FROM FILE MEDLINE
ANSWERS '8-21' FROM FILE BIOSIS
ANSWERS '22-26' FROM FILE AGRICOLA
ANSWERS '27-48' FROM FILE CABA
ANSWERS '49-55' FROM FILE HCAPLUS