

Title

**Summary of the Literature Review for GHB614 x LLCotton25 x MON 15985 Cotton  
July 1, 2019 – September 30, 2020**

**Final Report**

Data 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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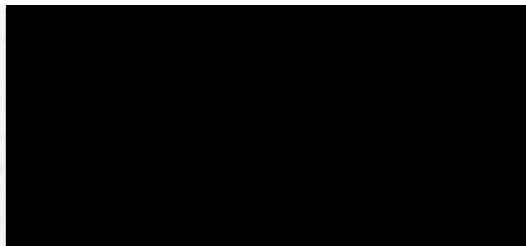


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Literature Review for GHB614 x LLCotton25 x MON 15985 Cotton  
July 1, 2019 – September 30, 2020  
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**SIGNATURE PAGE**

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Date

2020-11-30  
(YYYY-MM-DD)

## STUDY PERSONNEL

Electronic database search	[REDACTED]
Manual search	[REDACTED] [REDACTED] [REDACTED] [REDACTED]
Stage 1 assessment	[REDACTED] [REDACTED]
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 GLB2 cotton 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 GLB2 cotton, its effects on food and feed safety, or on environmental safety, that might require in-depth examination. A set of broad literature searches was performed using several bibliographic databases covering scientific literature from July 1, 2019 to September 30, 2020. 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 49 unique publications, which were subject to rapid assessment to exclude obviously irrelevant publications. A total of 6 publications were progressed for detailed assessment.

One of the 6 publications was determined to be relevant after detailed review. The relevant article did not constitute new data on molecular characterization of GLB2 cotton or the newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2, nor did it suggest any potential adverse effects on human and animal health or on the environment. No evidence was identified that would warrant conducting a systematic review.

In summary, these literature searches and review of the retrieved publications identified only one relevant publication that supports the existing safety assessment of the GLB2 cotton.

## 1. INTRODUCTION

BASF has used conventional breeding techniques to develop the stacked trait cotton product GHB614 x LLCotton25 x MON 15985 (GT x LL25 x BG2 cotton; GLB2 cotton) which confers 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 publications published between July 1, 2019 and September 30, 2020 that mention the molecular characterization of the GLB2 cotton, and/or any adverse effect of GLB2 cotton 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)<sup>1</sup> applications and post-market environmental monitoring activities (2019).

The literature searches were performed for the GLB2 cotton and its newly expressed protein 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2. The search terms also included relevant synonyms, trade names, intended traits, plant species and general GMO terms.

## 2. OVERALL METHODS

### 2.1. Objective of the scoping review

The objective of the scoping review was to survey the evidence base for the GLB2 cotton 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 PECO structure (Population, Exposure, Comparators, Outcome) if possible, and to address data requirements. They were modeled after the review question examples provided in the EFSA 2019 explanatory note<sup>1</sup>.

**Question 1:** Were any studies published during the reporting period that describe adverse effects on human or animal health or the environment of the GLB2 cotton and its newly expressed proteins 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2?

**Key elements:**

**Population:** Human health; animal health; environmental safety

**Exposure:** GTxLL cotton, derived food/feed products, newly expressed protein in GTxLL cotton

**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 GLB2 cotton and its newly expressed proteins 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2?



**Key elements:**

Population: GLB2 cotton and newly expressed proteins in GLB2 cotton

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 note<sup>1</sup> 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		
Intervention/exposure	The publication addresses the GMO, derived food/feed products, and/or the intended trait(s) (e.g., newly expressed protein(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
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
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
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

Additional concepts		
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

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(e), 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

Reporting format	The publication presents original/primary data.	This permits the exclusion of publications that do not present original/primary data (e.g., editorials, position papers). 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<sup>1</sup>: 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

One publication on GLB2 cotton was 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 x LLCotton25 x 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.

This article was selected as reference publications because it is directly relevant to the GLB2 event, and it mentions the event names (LLCotton25, GHB614, MON 15985), the newly expressed proteins (PAT/*bar*, 2mEPSPS and the Cry proteins) and the crop (cotton). Since this article was published outside the search period of this report, the search profile was tested without applying the time filters used in the final profile (UP>=20190701 and UP<=20200930).

## 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 activities<sup>1</sup>. 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 20, 2020. Only documents updated between July 1, 2019 and September 30, 2020, 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 profiles were designed to cover the following elements: event names, trade names, newly expressed proteins and intended traits. A profile was prepared for each element (event name, trade name, etc) in each event, and then combined so that only documents describing the triple stack or double stack subcombinations would be identified.

Since the 'intended trait' profile produced too many results when used on their own, it was combined with additional profiles: a 'plant species' profile and a 'general GMO' profile. See [Table 2](#) for a detailed search profile.

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

The search results were limited to documents updated between July 1, 2019 and September 30, 2020 (UP>=20190701 and UP<=20200930), and to non-patent documents (not P/DT). To ensure that documents with indexing errors where two 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 3](#) summarizes the number of results obtained from each of the databases searched.

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

**Table 2: Search profile for database search**

Set	Search string	Concepts
1	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 ACS-GH001-3 or ACS(w)GH001(w)3 or ACSGH001(w)3	Event Name 1
2	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 BCS-GH002-5 or BCS(w)GH002(w)5 or BCSGH002-5	Event Name 2
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 3
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 5	Event Name all
6	GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(w)TOL? OR GLY(w)TOLTM? OR GLY(w)TOLRTM?	Trade Name 1
7	libertylink or libertylinktm or libertylinkrtm or liberty(w)link or liberty(w)linktm or liberty(w)linkrtm or LL or LLTM or LLRTM	Trade Name 2
8	bollgard? or bolgard?	Trade Name 3
9	(6 and 7) or (6 and 8) or (8 and 9)	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 ENOLPYRUVYOYLSHIKAMATE or ENOYLPYRUVYOYLSHIKIMATE 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)PYRUVYOYLSHIKIMATE 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 ENOLPYRUVYOYL(W) SHIKIMIC (3W) PHOSPHOSYNTHASE)) (s) ((DOUBL# or DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M))	Newly Expressed Protein 1

11	((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 or phosphinothricin (w) n (w) acetyltransferase or phosphinothricin (2w) acetyltransferase or phosphinothricin (2w) acetyl (w) transferase or phosphinothricin acetyl (w) transferase	Newly Expressed Protein 2
12	crylac or cryl (w) ac or cry (w) l (w) ac or cry (w) l (w) a (w) c or cry (w) lac or cryla (w) c or cryIac or cryl (w) ac or cry (w) I (w) ac or cry (w) I (w) a (w) c or cry (w) Iac or cryIa (w) c or crylac or cryl (w) ac or cry (w) l (w) ac or cry (w) l (w) a (w) c or cry (w) lac or cryla (w) c or cry2Ab2 or cry2Ab (w) 2 or cry2A (w) b2 or cry2 (w) Ab2 or cry (w) 2Ab2 or cry2Ab (w) 2 or cry2 (w) Ab (w) 2 or cry (w) 2 (w) Ab (w) 2 or cry (w) 2 (w) A (w) b (w) 2 or cry2A (w) b2 or cry2A (w) b2 or cry2A (w) b (w) 2 or cry (w) 2Ab2 or cry (w) 2 (w) Ab2 or cry (w) 2A (w) b2 or cry (w) 2Ab2 or cry (w) 2Ab (w) 2	Newly Expressed Protein 3
13	(10 and 11) or (10 and 12) or (11 and 12)	Newly Expressed Proteins all
14	s (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 Trait 1
15	s (herbicid? or bialaphos or basta or glufosinate or gluphosinate or phosphinothricin or liberty?) (5a) (resist? OR protect? OR toleran?)	Intended Trait 2
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) epsilon 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 Trait 3
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	13 and 14 and 15	Intended trait all AND Plant species AND GMO general
21	5 or 9 or 13 or 20	Event Name all OR Trade Name all OR Newly Expressed Proteins all or (Intended Traits all AND Plant species AND GMO general)



**Table 3: 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	20 Oct 2020	20 Oct 2020	20 Oct 2020	20 Oct 2020	20 Oct 2020
Datespan of the search	1 Jul 2019 – 30 Sept 2020	1 Jul 2019 – 30 Sept 2020	1 Jul 2019 – 30 Sept 2020	1 Jul 2019 – 30 Sept 2020	1 Jul 2019 – 30 Sept 2020
Latest database update	24 Aug 2020	14 Oct 2020	14 Oct 2020	19 Oct 2020	19 Oct 2020
Number of records retrieved	5	16	15	14	9
Number of records after duplicate removal	4	15	11	10	9
Number of relevant records after rapid assessment	0	0	1	3	2

## 4. MANUAL SEARCHES

### 4.1. Manual searches of web pages of food safety, agriculture, and biotechnology-related authority webpages

In accordance with the EFSA 2019 explanatory note<sup>1</sup>, the search in electronic bibliographic databases has been complemented with an internet search in webpages of relevant key organisations involved in the risk assessment of GM plants. Of the 13 key organisations cited in the EFSA 2019 explanatory note<sup>1</sup>, two (Environment and Climate Change Canada and CIBIOGEM) are not involved in the risk assessment of GM plants and six (the US Department of Agriculture (USDA), the US Food and Drug Administration (FDA), the Canadian Food Inspection Agency (CFIA), Health Canada, the Food Standards Australia New Zealand (FSANZ), and the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF)) do not regulate GM stacked products developed by conventional breeding techniques. Therefore, the internet search was limited to the five key organisations, the US Environmental Protection Agency (EPA), OGTR, CTNBIO, CONABIA, and GEAC, relevant for GTxLL cotton.

Search terms consisted of "(GHB614 or GlyTol or BCS-GH002-5) x (LLCotton25 or LL25 or ACS-GH001-3) x (MON 15985 or BGII or BG2 or BollgardII or Bollgard2 or MON-15985-7); Cry1Ac; Cry2Ab2; 2mEPSPS or double mutant 5-enolpyruvyl shikimate-3-phosphate synthase enzyme; or PAT/bar or Phosphinothricin in GLB2 (all searched singly, with no search limits applied).



Search results were manually examined for relevant records that were either published during the time period under consideration (date span of search: July 1, 2019 to September 30, 2020) 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 4](#).

**Table 4: 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
US Environmental Protection Agency (EPA)	<a href="https://www.epa.gov/">https://www.epa.gov/</a>	Oct 27 2020, (Nov 16 2020)**	Oct 29 - Nov 2 2020, Nov 17 2020**	0
Office of the Gene Technology Regulator (OGTR) Australia	<a href="http://www.ogtr.gov.au/">http://www.ogtr.gov.au/</a>	Oct 15 2020, (Nov 17 2020)**	Oct 29 - Nov 2 2020, Nov 17 2020**	0
National Technical Commission on Biosafety (CTNBio) Brazil	<a href="http://ctnbio.mcti.gov.br/en">http://ctnbio.mcti.gov.br/en</a>	Oct 20	Oct 22-28 2020, Nov 17 2020**	0
National Advisory Commission on Agricultural Biotechnology (CONABIA) Argentina	<a href="https://www.argentina.gob.ar/agroindustria/bioeconomia/biotechnologia">https://www.argentina.gob.ar/agroindustria/bioeconomia/biotechnologia</a>	later than Aug 21 2020	Oct 21-22 2020, Nov 17 2020**	0
Genetic Engineering Approval Committee (GEAC) India	<a href="http://moef.gov.in/">http://moef.gov.in/</a> *	Oct 27 2020, (Nov 11 2020)**	Nov 3 2020, Nov 17 2020**	0

\* As the GEAC website does not have a search function the moef.gov.in website was searched instead.

\*\* Website searches for the Cry proteins were done on November 17 2020; the related dates of most recent site update are provided in parentheses.

## 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 July 1, 2019 and September 30, 2020. The resulting number of relevant studies found within the bibliographies of these review articles is given in [Table 5](#).

**Table 5: Documents for which reference lists were scanned for relevant studies**

No	Author(s) and Year	Title	Source	Number of relevant bibliographic references retrieved
1	Ansari WA, Chandanshive SU, Bhatt V, Nadaf AB, Vats S, Katara JL, Sonah H, Deshmukh R. 2020	Genome Editing in Cereals: Approaches, Applications and Challenges	Int J Mol Sci. 2020 Jun 5;21(11):4040. doi: 10.3390/ijms21114040 .	0
2	Arpaia S, Christiaens O, Giddings K, Jones H, Mezzetti B, Moronta-Barrios F, Perry JN, Sweet JB, Taning CNT, Smagghe G, Dietz-Pfeilstetter A. 2020	Biosafety of GM Crop Plants Expressing dsRNA: Data Requirements and EU Regulatory Considerations	Front Plant Sci. 2020 Jun 24;11:940. doi: 10.3389/fpls.2020.00940. eCollection 2020.	0
3	Babar U, Nawaz MA, Arshad U, Azhar MT, Atif RM, Golokhvast KS, Tsatsakis AM, Shcherbakova K, Chung G, Rana IA. 2020	Transgenic crops for the agricultural improvement in Pakistan: a perspective of environmental stresses and the current status of genetically modified crops	GM Crops Food. 2020;11(1):1-29. doi: 10.1080/21645698.2019.1680078. Epub 2019 Nov 3.	0
4	Bachtarzi H, Farries T. 2019	The Genetically Modified Organism Medicinal Framework in Europe, United States, and Japan: Underlying Scientific Principles and Considerations Toward the Development of Gene Therapy and Genetically Modified Cell-Based Products	Hum Gene Ther Clin Dev. 2019 Sep;30(3):114-128. doi: 10.1089/humc.2019.042. Epub 2019 Jun 21.	0

5	Bedair M, Glenn KC. 2020	Evaluation of the use of untargeted metabolomics in the safety assessment of genetically modified crops	Metabolomics. 2020 Oct 9;16(10):111. doi: 10.1007/s11306-020-01733-8.	0
6	Feng XJ, Yi HM, Ren XX, Ren JL, Ge JR, Wang FG. 2020	[Digital PCR and its application in biological detection]	Yi Chuan. 2020 Apr 20;42(4):363-373. doi: 10.16288/j.ycz.19-351.	0
7	Giraldo PA, Shinozuka H, Spangenberg GC, Cogan NOI, Smith KF. 2019	Safety Assessment of Genetically Modified Feed: Is There Any Difference From Food?	Front Plant Sci. 2019 Dec 11;10:1592. doi: 10.3389/fpls.2019.01592. eCollection 2019.	0
8	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.	0
9	Holme IB, Gregersen PL, Brinch-Pedersen H. 2019	Induced Genetic Variation in Crop Plants by Random or Targeted Mutagenesis: Convergence and Differences	Front Plant Sci. 2019 Nov 14;10:1468. doi: 10.3389/fpls.2019.01468. eCollection 2019.	0
10	Jyoti A, Kaushik S, Srivastava VK, Datta M, Kumar S, Yugandhar P, Kothari SL, Rai V, Jain A. 2019	The potential application of genome editing by using CRISPR/Cas9, and its engineered and ortholog variants for studying the transcription factors involved in the maintenance of phosphate homeostasis in model plants	Semin Cell Dev Biol. 2019 Dec;96:77-90. doi: 10.1016/j.semcdb.2019.03.010. Epub 2019 Apr 7.	0

11	Kadoić Balaško M, Mikac KM, Bažok R, Lemic D. 2020	Modern Techniques in Colorado Potato Beetle ( <i>Leptinotarsa decemlineata</i> Say) Control and Resistance Management: History Review and Future Perspectives	Insects. 2020 Sep 1;11(9):581. doi: 10.3390/insects11090581.	0
12	Kamle M, Mahato DK, Devi S, Soni R, Tripathi V, Mishra AK, Kumar P. 2020	Nanotechnological interventions for plant health improvement and sustainable agriculture	3 Biotech. 2020 Apr;10(4):168. doi: 10.1007/s13205-020-2152-3. Epub 2020 Mar 14.	0
13	Kauffmann F, Van Damme P, Leroux-Roels G, Vandermeulen C, Berthels N, Beuneu C, Mali S. 2019	Clinical trials with GMO-containing vaccines in Europe: Status and regulatory framework	Vaccine. 2019 Sep 30;37(42):6144-6153. doi: 10.1016/j.vaccine.2019.08.018. Epub 2019 Sep 4.	0
14	Kenter MJH, Clevers JC, Cornelissen J, Medema RH. 2019	[Environmental regulations impede cancer research and treatment]	Ned Tijdschr Geneesk. 2019 Dec 5;163:D4267.	0
15	Keshani P, Sharifi MH, Heydari MR, Joulaei H. 2020	The Effect of Genetically Modified Food on Infertility Indices: A Systematic Review Study	ScientificWorldJournal. 2020 Aug 13;2020:1424789. doi: 10.1155/2020/1424789. eCollection 2020.	0
16	Kumar K, Gambhir G, Dass A, Tripathi AK, Singh A, Jha AK, Yadava P, Choudhary M, Rakshit S. 2020	Genetically modified crops: current status and future prospects	Planta. 2020 Mar 31;251(4):91. doi: 10.1007/s00425-020-03372-8.	0
17	Papadopoulou N, Devos Y, Álvarez-Alfageme F, Lanzoni A, Waigmann E. 2020	Risk Assessment Considerations for Genetically Modified RNAi Plants: EFSA's Activities and Perspective	Front Plant Sci. 2020 Apr 21;11:445. doi: 10.3389/fpls.2020.00445. eCollection 2020.	0

18	Pottinger SE, Innes RW. 2020	RPS5-Mediated Disease Resistance: Fundamental Insights and Translational Applications	Annu Rev Phytopathol. 2020 Aug 25;58:139-160. doi: 10.1146/annurev-phyto-010820-012733. Epub 2020 Apr 13.	0
19	Rumin J, Nicolau E, Junior RGO, Fuentes-Grünwald C, Picot L. 2020	Analysis of Scientific Research Driving Microalgae Market Opportunities in Europe	Mar Drugs. 2020 May 18;18(5):264. doi: 10.3390/md18050264.	0
20	Woźniak E, Waszkowska E, Zimny T, Sowa S, Twardowski T. 2019	The Rapeseed Potential in Poland and Germany in the Context of Production, Legislation, and Intellectual Property Rights	Front Plant Sci. 2019 Nov 5;10:1423. doi: 10.3389/fpls.2019.01423. eCollection 2019.	0

## 5. RESULTS OF THE STUDY IDENTIFICATION AND SELECTION PROCESS

The database searches ([Section 3](#)) identified a total of 59 references, which were reduced to 49 after removal of duplicates ([Table 3](#)). 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 stage 1 reviewers agreed in 100% of the evaluations

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, one member of the stack, other herbicide resistant GM crops, unrelated topics, etc.

Publications which appear 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 6](#) 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. All eligible references were assessed in detail. This detailed assessment included evaluation of the scope of the article and the study quality and reliability. Categorization of reliability (as described in the EFSA 2019 explanatory note<sup>1</sup> and reported in [Table 11](#)) was dependent upon the following:

- appropriateness of methodology
- whether the description of methodology would allow independent repetition of the study
- extent of characterization of test materials
- reporting of evidence of reproducibility

[Table 6](#) gives an overview of the reference selection process and results of the detailed assessment.

**Table 6: Results of the publication selection process**

Total number of publications retrieved after all searches of the scientific literature (excluding duplicates)	49
Number of publications excluded from the search results after rapid assessment for relevance (Stage 1)	43
Total number of full-text documents assessed in detail	6
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	1

[Table 7](#) 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 8](#). [Table 9](#) lists the publications for which full-text documents were unobtainable for detailed assessment or for which relevance was unclear after detailed assessment.

**Table 7: 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	Source
Food and Feed Safety	Naegeli Hanspeter, Birch Andrew Nicholas Casacuberta Josep, De Schrijver Adinda Gralak Mikolaj Antoni, Guerche Philippe Jones Huw, Manachini Barbara Messean Antoine, Nielsen Elsa Ebbesen Nogue Fabien, Robaglia Christophe Rostoks Nils, Sweet Jeremy Tebbe Christoph, Visioli Francesco Wal Jean-Michel, Broll Hermann Gennaro Andrea, Neri Franco Maria Paraskevopoulos Konstantinos  2018	Assessment of genetically modified cotton GHB614 x LLCotton25 x MON 15985 for food and feed uses, under Regulation (EC) No 1829/2003 (application EFSA-GMO-NL-2011-94).	EFSA journal. European Food Safety Authority, (2018 Apr) Vol. 16, No. 4, pp. e05213. Electronic Publication Date: 20 Apr 2018 Journal code: 101642076. E-ISSN: 1831-4732. L-ISSN: 1831-4732. Report No.: PMC-PMC7009700.

**Table 8: 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 <a href="#">Table 1</a>
Naegeli Hanspeter Bresson Jean-Louis Dalmay Tamas Dewhurst Ian Crawford Epstein Michelle M Firbank Leslie George Guerche Philippe Hejatko Jan Moreno Francisco Javier Mullins Ewen Nogue Fabien Rostoks Nils Sanchez Serrano Jose Juan Savoini Giovanni Veromann Eve Veronesi Fabio Alvarez Fernando Ardizzone Michele Paraskevopoulos Konstantinos 2018	Assessment of genetically modified LLCotton25 for renewal of authorisation under Regulation (EC) No 1829/2003 (application EFSA-GMO -RX-010).	EFSA journal. European Food Safety Authority, (2018 Nov) Vol. 16, No. 11, pp. e05473. Electronic Publication Date: 14 Nov 2018 Journal code: 101642076. E-ISSN: 1831-4732. L-ISSN: 1831-4732. Report No.: PMC-PMC7009552.	The report is not specific to the GHB614 x LLCotton25 x MON 15985 cotton. The focus is on LLCotton25 cotton.
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 paper evaluated the extent of gene flow of NewCott 33B and TFD cotton in the field. The ERA is not related to 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 <a href="#">Table 1</a>
Ricroch, A. Akkoyunlu, S. Martin-Laffon, J. Kuntz, M. Editor(s): Kuntz, M. 2018	Assessing the environmental safety of transgenic plants: honey bees as a case study. Special Issue: Transgenic plants and beyond.	Advances in Botanical Research (2018), Volume 86, pp. 111-167, 34 refs. ISSN: 0065-2296 Published by: Elsevier Ltd, Oxford	Review of 64 peer-reviewed papers (from 1994 to 2017) and 18 US EPA studies (from 1993 to 2002) related to the effect of GM crops (protease inhibitors, Cry, Vip, RNAi-producing and HT) such as cotton, soybean and maize on honey bees. No original/primary data related to ERA of GHB614 x LLCotton25 x MON 15985 cotton.
Salisu, Ibrahim Bala Shahid, Ahmad Ali Yaqoob, Amina Rao, Abdul Qayyum Husnain, Tayyab. 2019	Effect of dietary supplementation of recombinant Cry and Cp4 epsps proteins on haematological indices of growing rabbits	Journal of Animal Physiology and Animal Nutrition (2019 ), 103(1), 305-316 CODEN: JAPNEF; ISSN: 0931-2439	GHB614 x LL25 x MON15985 cotton was not included in the study.
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) Ahead of Print CODEN: ARGEFW; ISSN: 2249-7218	The authors tested adventitious presence of transgenes in 100 <i>ex situ</i> accessions of cotton being conserved in the National Genebank of India using Pentaplex PCR assay. The ERA is not related to GHB614 x LLCotton25 x MON 15985 cotton.

**Table 9: 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 6 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 one publication was relevant for the food and feed safety assessment of the GLB2 cotton and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2.

The publication identified as relevant, Naegeli *et al.* 2018, provides a scientific risk assessment performed by the EFSA GMO Panel on data submitted in the context of the authorisation application for the GLB2 cotton. The EFSA GMO Panel previously assessed the three single events and did not identify safety concerns. No new data on the single events that could lead to modification of the original conclusions on their safety were identified. The GMO Panel considered that cotton GHB614 x LLCotton25 x MON 15985, as described in the application, is as safe as the non-GM comparator with respect to potential effects on human and animal health and the environment.

[Table 10](#) and [Table 11](#) list the relevant publication along with a summary of any adverse effects reported and the reliability of the publications.

**Table 10: Report of the summary 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) and year)	Intervention/ test materials used	Adverse effects reported	Which adverse effect reported
Food and Feed Safety	Naegeli Hanspeter Birch Andrew Nicholas Casacuberta Josep De Schrijver Adinda Gralak Mikolaj Antoni Guerche Philippe Jones Huw Manachini Barbara Messean Antoine Nielsen Elsa Ebbesen Nogue Fabien Robaglia Christophe Rostoks Nils Sweet Jeremy Tebbe Christoph Visioli Francesco Wal Jean-Michel Broll Hermann Gennaro Andrea Neri Franco Maria Paraskevopoulos Konstantinos.  2018	GHB614 x LLCotton25 x MON 15985	None	Not applicable

**Table 11: Report of the reliability and implications for the risk assessment 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) and year)	Summary of reliability appraisal	Implications for risk assessment
Food and Feed Safety	Naegeli Hanspeter Birch Andrew Nicholas Casacuberta Josep De Schrijver Adinda Gralak Mikolaj Antoni Guerche Philippe Jones Huw Manachini Barbara Messean Antoine Nielsen Elsa Ebbesen Nogue Fabien Robaglia Christophe Rostoks Nils Sweet Jeremy Tebbe Christoph Visioli Francesco Wal Jean-Michel Broll Hermann Gennaro Andrea Neri Franco Maria Paraskevopoulos Konstantinos. 2018	High	None, because no new hazards, modified exposure, or scientific uncertainties are reported.

## 7. CONCLUSION

The literature searches performed for the GLB2 cotton and its newly expressed proteins, 2mEPSPS, PAT/*bar*, Cry1Ac and Cry2Ab2, for the period from July 1, 2019 to September 30, 2020, identified a total of 49 unique publications (after duplicate removal). A total of 6 publications were progressed for detailed assessment after excluding 43 obviously irrelevant publications during Stage 1 evaluation (rapid assessment based on title and abstract).

The 6 publications that progressed to Stage 2 were evaluated in detail, based on full text, for potential relevance, following the pre-established criteria listed in [Table 1](#). One relevant reference with bearing on food and feed safety was identified. The data and knowledge generated from this study does not impact the safety assessment of GLB2 cotton. No issues or topics were identified that would trigger or warrant more specific question formulation.

## 8. REFERENCES

### No. Author(s), title, source, edition, year, pages

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

CHARGED TO COST=88133322

- L1 3 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 OR BCS-GH002-5 OR BCS(W)GH002(W)5 OR BCSGH002-5
- 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 OR BCS-GH002-5X OR BCS(W)GH002(W)5X OR BCSGH002-5X
- L3 3 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 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 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 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 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 10 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)614XLLCOTTON25XMON(W)15985
- 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)MON15985 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 69 SEA BOLLGARD? OR BOLGARD?
- L15 23 SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM OR FIBERMAX OR FIBER(W)MAX OR FIBERMAXTM OR FIBER(W)MAXTM OR FIBERMAXRTM OR FIBER(W)MAXRTM OR FIBERMAXR OR FIBER(W)MAXR
- L16 2 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR GLY(W)TOLTM? OR GLY(W)TOLRTM?
- L17 0 SEA (L14 AND L15) OR (L14 AND L16) OR (L15 AND L16)
- L18 12 SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS
- L19 4136 SEA EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOYLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4W) (PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE)
- L20 0 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVYL) (W) (PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE)
- L21 357 SEA (ENOL(W)PYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVYOL) (W) SHIKIMATE) (3W) PHOSPHATE (W) (SYNTHASE OR SYNTHETASE)

L22 458 SEA (PHOSPHOSHIKIMATE(2W)CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE(2W)CARBOXYVINYL(W)TRANSFERASE OR ENOLPYRUVYL(W)SHIKIMIC(3W)PHOSPHOSYNTHASE)

L23 23600 SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)

L24 18 SEA L18 OR ((L19 OR L20 OR L21 OR L22)) (S) L23)

L25 1390 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

L26 202 SEA PHOSPHINOTHRICIN(W)N(W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYL(W)TRANSFERASE

L27 1464 SEA L25 OR L26

L28 1104 SEA CRY1AC OR CRY1(W)AC OR CRY(W)1(W)AC OR CRY(W)1(W)A(W)C OR CRY(W)1AC OR CRY1A(W)C

L29 127 SEA CRYIAC OR CRYI(W)AC OR CRY(W)I(W)AC OR CRY(W)I(W)A(W)C OR CRY(W)IAC OR CRYIA(W)C

L30 56 SEA CRYLAC OR CRYL(W)AC OR CRY(W)L(W)AC OR CRY(W)L(W)A(W)C OR CRY(W)LAC OR CRYLA(W)C

L31 75 SEA CRY2AB2 OR CRY2AB(W)2 OR CRY2A(W)B2 OR CRY2(W)AB2 OR CRY(W)2AB2 OR CRY2AB(W)2 OR CRY2(W)AB(W)2 OR CRY(W)2(W)AB(W)2 OR CRY(W)2(W)A(W)B(W)2

L32 0 SEA CRY2A(W)B2 OR CRY2A(W)B2 OR CRY2A(W)B(W)2 OR CRY(W)2AB2 OR CRY(W)2(W)AB2 OR CRY(W)2A(W)B2 OR CRY(W)2AB2 OR CRY(W)2AB(W)2

L33 1305 SEA (L28 OR L29 OR L30 OR L31 OR L32)

L34 22 SEA (L24 AND L27) OR (L24 AND L33) OR (L27 AND L33)

L35 3232 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?)

L36 3083 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR PROTECT? OR TOLERAN?)

L37 196433 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

L38 13427 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 ELASMO PALPUS OR E(W)LIGNOSELLUS OR D(W)SACCHARALIS OR STRIACOSTA OR S(W)ALBICOSTA

L39 20993 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

L40 2250809 SEA (RESIST? OR PROTECT? OR TOLERAN?)

L41 7743 SEA ((L37 OR L38 OR L39)) (5A) L40

L42 2854 SEA (L35 AND L36) OR (L35 AND L41) OR (L36 AND L41)

L43 25137 SEA COTTON# OR GOSSYPIMUM OR G(W)HIRSUTUM OR G(W)BARBADENSE

L44 3605142 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?))

L45 107 SEA L42 AND L43 AND L44

L46 129 SEA L13 OR L17 OR L34 OR L45

L47 27 SEA L46 AND PY>=2018

L48 9 SEA L47 AND UP>=20190701 AND UP<=20200930

FILE 'BIOSIS' ENTERED AT 09:49:58 ON 20 OCT 2020

L49 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 BCSGH002-5

L50 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 BCSGH002-5X



L51	4	SEA (L49 OR L50)
L52	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 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3
L53	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 OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X
L54	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 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3
L55	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 OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X
L56	4	SEA (L52 OR L53 OR L54 OR L55)
L57	13	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
L58	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
L59	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
L60	0	SEA (L58 OR L59)
L61	1	SEA (L51 AND L56) OR (L51 AND L57) OR (L56 AND L57) OR L60
L62	201	SEA BOLLGARD? OR BOLGARD?
L63	144	SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM OR FIBERMAX OR FIBER(W)MAX OR FIBERMAXTM OR FIBER(W)MAXTM OR FIBERMAXRTM OR FIBER(W)MAXRTM OR FIBERMAXR OR FIBER(W)MAXR
L64	5	SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR GLY(W)TOLTM? OR GLY(W)TOLRTM?
L65	3	SEA (L62 AND L63) OR (L62 AND L64) OR (L63 AND L64)
L66	12	SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS
L67	4944	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)
L68	0	SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE)
L69	682	SEA (ENOL(W)PYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE) (3W) PHOSPHATE (W) (SYNTHASE OR SYNTHETASE)
L70	27	SEA (PHOSPHOSHIKIMATE (2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE (2W) CARBOXYVINYL (W) TRANSFERASE OR ENOLPYRUVOYL (W) SHIKIMIC (3W) PHOSPHOSYNTHASE)
L71	26139	SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)
L72	18	SEA L66 OR ((L67 OR L68 OR L69 OR L70)) (S)L71)
L73	2749	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
L74	326	SEA PHOSPHINOTHRICIN(W)N(W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYL(W)TRANSFERASE OR PHOSPHINOTHRICINACETYL(W)TRANSFERASE

L75 2849 SEA L73 OR L74  
L76 1796 SEA CRY1AC OR CRY1(W)AC OR CRY(W)1(W)AC OR CRY(W)1(W)A(W)C OR CRY(W)1AC OR CRY1A(W)C  
L77 226 SEA CRYIAC OR CRYI(W)AC OR CRY(W)I(W)AC OR CRY(W)I(W)A(W)C OR CRY(W)IAC OR CRYIA(W)C  
L78 357 SEA CRYLAC OR CRYL(W)AC OR CRY(W)L(W)AC OR CRY(W)L(W)A(W)C OR CRY(W)LAC OR CRYLA(W)C  
L79 101 SEA CRY2AB2 OR CRY2AB(W)2 OR CRY2A(W)B2 OR CRY2(W)AB2 OR CRY(W)2AB2 OR CRY2AB(W)2 OR CRY2(W)AB(W)2 OR CRY(W)2(W)AB(W)2 OR CRY(W)2(W)A(W)B(W)2  
L80 3 SEA CRY2A(W)B2 OR CRY2A(W)B2 OR CRY2A(W)B(W)2 OR CRY(W)2AB2 OR CRY(W)2(W)AB2 OR CRY(W)2A(W)B2 OR CRY(W)2AB2 OR CRY(W)2AB(W)2  
L81 2134 SEA (L76 OR L77 OR L78 OR L79 OR L80)  
L82 41 SEA (L72 AND L75) OR (L72 AND L81) OR (L75 AND L81)  
L83 10484 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?)  
L84 9424 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR PROTECT? OR TOLERAN?)  
L85 1384423 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  
L86 26082 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  
L87 30047 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  
L88 2281020 SEA (RESIST? OR PROTECT? OR TOLERAN?)  
L89 23393 SEA ((L85 OR L86 OR L87)) (5A)L88  
L90 9086 SEA (L83 AND L84) OR (L83 AND L89) OR (L84 AND L89)  
L91 72448 SEA COTTON# OR GOSSYPIMUM OR G(W)HIRSUTUM OR G(W)BARBADENSE  
L92 447208 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?))  
L93 241 SEA L90 AND L91 AND L92  
L94 286 SEA L61 OR L65 OR L82 OR L93  
L95 33 SEA L94 AND PY>=2018  
L96 16 SEA L95 AND UP>=20190701 AND UP<=20200930

FILE 'AGRICOLA' ENTERED AT 09:51:23 ON 20 OCT 2020

L97 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 OR BCS-GH002-5 OR BCS(W)GH002(W)5 OR BCSGH002-5  
L98 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 OR BCS-GH002-5X OR BCS(W)GH002(W)5X OR BCSGH002-5X  
L99 2 SEA (L97 OR L98)  
L100 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 OR ACS-GH001-3 OR ACS(W)GH001(W)3 OR ACSGH001(W)3  
L101 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 OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X  
L102 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 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3
L103	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 OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR XACSGH001(W)3X
L104	2 SEA (L100 OR L101 OR L102 OR L103)
L105	6 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
L106	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
L107	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
L108	0 SEA (L106 OR L107)
L109	0 SEA (L99 AND L104) OR (L99 AND L105) OR (L104 AND L105) OR L108
L110	181 SEA BOLLGARD? OR BOLGARD?
L111	79 SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM OR FIBERMAX OR FIBER(W)MAX OR FIBERMAXTM OR FIBER(W)MAXTM OR FIBERMAXRTM OR FIBER(W)MAXRTM OR FIBERMAXR OR FIBER(W)MAXR
L112	3 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR GLY(W)TOLTM? OR GLY(W)TOLRTM?
L113	3 SEA (L110 AND L111) OR (L110 AND L112) OR (L111 AND L112)
L114	2 SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS
L115	594 SEA 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)
L116	0 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE)
L117	287 SEA (ENOL(W)PYRUVOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE) (3W) PHOSPHATE (W) (SYNTHASE OR SYNTHETASE)
L118	210 SEA (PHOSPHOSHIKIMATE (2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE (2W) CARBOXYVINYL(W) TRANSFERASE OR ENOLPYRUVOYL(W) SHIKIMIC (3W) PHOSPHOSYNTHASE)
L119	6202 SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)
L120	7 SEA L114 OR ((L115 OR L116 OR L117 OR L118)) (S) L119)
L121	727 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
L122	240 SEA PHOSPHINOTHRICIN(W)N(W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W)ACETYL(W)TRANSFERASE OR PHOSPHINOTHRICINACETYL(W)TRANSFERASE
L123	802 SEA L121 OR L122
L124	1046 SEA CRY1AC OR CRY1(W)AC OR CRY(W)1(W)AC OR CRY(W)1(W)A(W)C OR CRY(W)1AC OR CRY1A(W)C
L125	149 SEA CRYIAC OR CRYI(W)AC OR CRY(W)I(W)AC OR CRY(W)I(W)A(W)C OR CRY(W)IAC OR CRYIA(W)C
L126	22 SEA CRYLAC OR CRYL(W)AC OR CRY(W)L(W)AC OR CRY(W)L(W)A(W)C OR CRY(W)LAC OR CRYLA(W)C
L127	66 SEA CRY2AB2 OR CRY2AB(W)2 OR CRY2A(W)B2 OR CRY2(W)AB2 OR CRY(W)2AB2 OR CRY2AB(W)2 OR CRY2(W)AB(W)2 OR CRY(W)2(W)AB(W)2 OR CRY(W)2(W)A(W)B(W)2

L128 0 SEA CRY2A(W)B2 OR CRY2A(W)B2 OR CRY2A(W)B(W)2 OR CRY(W)2AB2 OR  
CRY(W)2(W)AB2 OR CRY(W)2A(W)B2 OR CRY(W)2AB2 OR CRY(W)2AB(W)2  
L129 1241 SEA (L124 OR L125 OR L126 OR L127 OR L128)  
L130 17 SEA (L120 AND L123) OR (L120 AND L129) OR (L123 AND L129)  
L131 8050 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?)  
L132 7715 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR  
GLUPHOSINATE OR PHOSPHINOTHICIN OR LIBERTY?) (5A) (RESIST? OR  
PROTECT? OR TOLERAN?)  
L133 321638 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  
L134 13296 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  
L135 4206 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  
L136 558052 SEA (RESIST? OR PROTECT? OR TOLERAN?)  
L137 20583 SEA ((L133 OR L134 OR L135)) (5A)L136  
L138 7577 SEA (L131 AND L132) OR (L131 AND L137) OR (L132 AND L137)  
L139 61291 SEA COTTON# OR GOSSYPIMUM OR G(W)HIRSUTUM OR G(W)BARBADENSE  
L140 94680 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?))  
L141 211 SEA L138 AND L139 AND L140  
L142 230 SEA L109 OR L113 OR L130 OR L141  
L143 11 SEA L142 AND PY>=2018  
L144 5 SEA L143 AND UP>=20190701 AND UP<=20200930

FILE 'CABA' ENTERED AT 09:52:55 ON 20 OCT 2020

L145 6 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 OR BCS-GH002-5 OR BCS(W)GH002(W)5 OR  
BCSGH002-5  
L146 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 OR BCS-GH002-5X OR BCS(W)GH002(W)5X OR  
BCSGH002-5X  
L147 6 SEA (L145 OR L146)  
L148 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  
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  
L149 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 OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X  
L150 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 OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3  
L151 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 OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR  
XACSGH001(W)3X  
L152 5 SEA (L148 OR L149 OR L150 OR L151)  
L153 16 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

L154 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

L155 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

L156 1 SEA (L154 OR L155)

L157 2 SEA (L147 AND L152) OR (L147 AND L153) OR (L152 AND L153) OR  
L156

L158 374 SEA BOLLGARD? OR BOLGARD?

L159 208 SEA LIBERTYLINK OR LIBERTY(W)LINK OR LIBERTYLINKTM OR LIBERTY(W)  
)LINKTM OR LIBERTYLINKRTM OR LIBERTY(W)LINKRTM OR FIBERMAX OR  
FIBER(W)MAX OR FIBERMAXTM OR FIBER(W)MAXTM OR FIBERMAXRTM OR  
FIBER(W)MAXRTM OR FIBERMAXR OR FIBER(W)MAXR

L160 5 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W)TOL? OR  
GLY(W)TOLTM? OR GLY(W)TOLRTM?

L161 6 SEA (L158 AND L159) OR (L158 AND L160) OR (L159 AND L160)

L162 12 SEA 2MEPSPS OR 2(W)MEPSPS OR 2M(W)EPSPS OR 2(W)M(W)EPSPS

L163 1022 SEA EPSPS OR EPSP(W)SYNTHASE OR (ENOL(W)PYRUVYLSHIKIMATE OR  
ENOL(W)PYRUVYL(W)SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUV  
OYLSHIKAMATE OR ENOYLPYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4  
W) (PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE)

L164 0 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKI  
MATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (S  
YNTHASE OR SYNTHETASE)

L165 400 SEA (ENOL(W)PYRUVYOYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR  
ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE  
) (3W) PHOSPHATE (W) (SYNTHASE OR SYNTHETASE)

L166 151 SEA (PHOSPHOSHIKIMATE (2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIK  
IMATE (2W) CARBOXYVINYL (W) TRANSFERASE OR ENOLPYRUVOYL (W) SHIKIMIC (3  
W) PHOSPHOSYNTHASE)

L167 6860 SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)

L168 17 SEA L162 OR (((L163 OR L164 OR L165 OR L166)) (S) L167)

L169 1482 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

L170 368 SEA PHOSPHINOTHRICIN (W) N (W) ACETYLTRANSFERASE OR PHOSPHINOTHRICI  
N (2W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN (2W) ACETYL (W) TRANSFER  
ASE OR PHOSPHINOTHRICINACETYL (W) TRANSFERASE

L171 1582 SEA L169 OR L170

L172 1974 SEA CRY1AC OR CRY1 (W) AC OR CRY (W) 1 (W) AC OR CRY (W) 1 (W) A (W) C OR  
CRY (W) 1AC OR CRY1A (W) C

L173 234 SEA CRYIAC OR CRYI (W) AC OR CRY (W) I (W) AC OR CRY (W) I (W) A (W) C OR  
CRY (W) IAC OR CRYIA (W) C

L174 38 SEA CRYLAC OR CRYL (W) AC OR CRY (W) L (W) AC OR CRY (W) L (W) A (W) C OR  
CRY (W) LAC OR CRYLA (W) C

L175 120 SEA CRY2AB2 OR CRY2AB (W) 2 OR CRY2A (W) B2 OR CRY2 (W) AB2 OR  
CRY (W) 2AB2 OR CRY2AB (W) 2 OR CRY2 (W) AB (W) 2 OR CRY (W) 2 (W) AB (W) 2  
OR CRY (W) 2 (W) A (W) B (W) 2

L176 1 SEA CRY2A (W) B2 OR CRY2A (W) B2 OR CRY2A (W) B (W) 2 OR CRY (W) 2AB2 OR  
CRY (W) 2 (W) AB2 OR CRY (W) 2A (W) B2 OR CRY (W) 2AB2 OR CRY (W) 2AB (W) 2

L177 2298 SEA (L172 OR L173 OR L174 OR L175 OR L176)

L178 34 SEA (L168 AND L171) OR (L168 AND L177) OR (L171 AND L177)

L179 18048 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?)

L180 17371 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR  
GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR  
PROTECT? OR TOLERAN?)

L181 882190 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  
L182 31304 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  
L183 12170 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  
L184 1216927 SEA (RESIST? OR PROTECT? OR TOLERAN?)  
L185 66456 SEA ((L181 OR L182 OR L183)) (5A)L184  
L186 17056 SEA (L179 AND L180) OR (L179 AND L185) OR (L180 AND L185)  
L187 92012 SEA COTTON# OR GOSSYPIMUM OR G(W)HIRSUTUM OR G(W)BARBADENSE  
L188 173943 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?))  
L189 469 SEA L186 AND L187 AND L188  
L190 505 SEA L157 OR L161 OR L178 OR L189  
L191 42 SEA L190 AND PY>=2018  
L192 15 SEA L191 AND UP>=20190701 AND UP<=20200930  
L193 15 SEA L192 NOT P/DT  
L194 0 SEA L192 AND (P/DT AND J/DT)  
L195 15 SEA L193 OR L194

FILE 'HCAPLUS' ENTERED AT 09:54:15 ON 20 OCT 2020

L196 8 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 OR BCS-GH002-5 OR BCS(W)GH002(W)5 OR  
BCSGH002-5  
L197 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 OR BCS-GH002-5X OR BCS(W)GH002(W)5X OR  
BCSGH002-5X  
L198 8 SEA (L196 OR L197)  
L199 10 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 OR ACS-GH001-3  
OR ACS(W)GH001(W)3 OR ACSGH001(W)3  
L200 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  
OR ACS-GH001-3X OR ACS(W)GH001(W)3X OR ACSGH001(W)3X  
L201 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  
OR XACS-GH001-3 OR XACS(W)GH001(W)3 OR XACSGH001(W)3  
L202 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 OR XACS-GH001-3X OR XACS(W)GH001(W)3X OR  
XACSGH001(W)3X  
L203 10 SEA (L199 OR L200 OR L201 OR L202)  
L204 32 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  
L205 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  
L206 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) MON15985 OR GHB614(W) TIME#(W) LLCOTTON25(W) TIME#(W) MON(W) 15985

L207 1 SEA (L205 OR L206)

L208 8 SEA (L198 AND L203) OR (L198 AND L204) OR (L203 AND L204) OR L207

L209 181 SEA BOLLGARD? OR BOLGARD?

L210 132 SEA LIBERTYLINK OR LIBERTY(W) LINK OR LIBERTYLINKTM OR LIBERTY(W) LINKTM OR LIBERTYLINKRTM OR LIBERTY(W) LINKRTM OR FIBERMAX OR FIBER(W) MAX OR FIBERMAXTM OR FIBER(W) MAXTM OR FIBERMAXRTM OR FIBER(W) MAXRTM OR FIBERMAXR OR FIBER(W) MAXR

L211 8 SEA GLYTOL? OR GLYTOLTM? OR GLYTOLRTM? OR GLY(W) TOL? OR GLY(W) TOLTM? OR GLY(W) TOLRTM?

L212 4 SEA (L209 AND L210) OR (L209 AND L211) OR (L210 AND L211)

L213 29 SEA 2MEPSPS OR 2(W) MEPSPS OR 2M(W) EPSPS OR 2(W) M(W) EPSPS

L214 4246 SEA EPSPS OR EPSP(W) SYNTHASE OR (ENOL(W) PYRUVYLSHIKIMATE OR ENOL(W) PYRUVYL(W) SHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOYLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC) (4W) (PHOSPHATE OR PHOSPHORIC) (2W) (SYNTHASE OR SYNTHETASE)

L215 9 SEA (ENOLPYRUVYL OR ENOLPYRUYL OR ENOLPYRUVOYL) (W) (PHOSPHOSHIKIMATE OR PHOSPHOSHIKIMIC OR ENOLPYRUVYLSHIKIMATEPHOSPHATE) (2W) (SYNTHASE OR SYNTHETASE)

L216 1039 SEA (ENOL(W) PYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMATE OR ENOLPYRUVYLSHIKIMIC OR ENOL(W) (PYRUVYL OR PYRUVOYL) (W) SHIKIMATE) (3W) PHOSPHATE(W) (SYNTHASE OR SYNTHETASE)

L217 86 SEA (PHOSPHOSHIKIMATE(2W) CARBOXYVINYLTRANSFERASE OR PHOSPHOSHIKIMATE(2W) CARBOXYVINYL(W) TRANSFERASE OR ENOLPYRUVOYL(W) SHIKIMIC(3W) PHOSPHOSYNTHASE)

L218 73385 SEA ((DOUBL# OR DOBL#) (W) (MUTANT# OR MUTAT?) OR 2M)

L219 41 SEA L213 OR ((L214 OR L215 OR L216 OR L217)) (S) L218)

L220 6904 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

L221 761 SEA PHOSPHINOTHRICIN(W) N(W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W) ACETYLTRANSFERASE OR PHOSPHINOTHRICIN(2W) ACETYL(W) TRANSFERASE OR PHOSPHINOTHRICINACETYL(W) TRANSFERASE

L222 7193 SEA L220 OR L221

L223 2149 SEA CRY1AC OR CRY1(W) AC OR CRY(W) 1(W) AC OR CRY(W) 1(W) A(W) C OR CRY(W) 1AC OR CRY1A(W) C

L224 1762 SEA CRYIAC OR CRYI(W) AC OR CRY(W) I(W) AC OR CRY(W) I(W) A(W) C OR CRY(W) IAC OR CRYIA(W) C

L225 72 SEA CRYLAC OR CRYL(W) AC OR CRY(W) L(W) AC OR CRY(W) L(W) A(W) C OR CRY(W) LAC OR CRYLA(W) C

L226 109 SEA CRY2AB2 OR CRY2AB(W) 2 OR CRY2A(W) B2 OR CRY2(W) AB2 OR CRY(W) 2AB2 OR CRY2AB(W) 2 OR CRY2(W) AB(W) 2 OR CRY(W) 2(W) AB(W) 2 OR CRY(W) 2(W) A(W) B(W) 2

L227 1 SEA CRY2A(W) B2 OR CRY2A(W) B2 OR CRY2A(W) B(W) 2 OR CRY(W) 2AB2 OR CRY(W) 2(W) AB2 OR CRY(W) 2A(W) B2 OR CRY(W) 2AB2 OR CRY(W) 2AB(W) 2

L228 2870 SEA (L223 OR L224 OR L225 OR L226 OR L227)

L229 118 SEA (L219 AND L222) OR (L219 AND L228) OR (L222 AND L228)

L230 27450 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?)

L231 26461 SEA (HERBICID? OR BIALAPHOS OR BASTA OR GLUFOSINATE OR GLUPHOSINATE OR PHOSPHINOTHRICIN OR LIBERTY?) (5A) (RESIST? OR PROTECT? OR TOLERAN?)

L232 292285 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

L233 21849 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

L234                    D(W)SACCHARALIS OR STRIACOSTA OR S(W)ALBICOSTA  
21758 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  
L235           5495466 SEA (RESIST? OR PROTECT? OR TOLERAN?)  
L236           37360 SEA ((L232 OR L233 OR L234)) (5A)L235  
L237           26052 SEA (L230 AND L231) OR (L230 AND L236) OR (L231 AND L236)  
L238           250812 SEA COTTON# OR GOSSYPIUM OR G(W)HIRSUTUM OR G(W)BARBADENSE  
L239           664728 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?))  
L240           1266 SEA L237 AND L238 AND L239  
L241           1380 SEA L208 OR L212 OR L229 OR L240  
L242           480 SEA L241 AND PY>=2018  
L243           115 SEA L242 AND UP>=20190701 AND UP<=20200930  
L244           14 SEA L243 NOT P/DT  
L245           0 SEA L243 AND (P/DT AND J/DT)  
L246           14 SEA L244 OR L245

FILE 'MEDLINE, BIOSIS, AGRICOLA, CABA, HCAPLUS' ENTERED AT 09:55:59 ON 20  
OCT 2020

L247           49 DUP REM L48 L96 L144 L195 L246 (10 DUPLICATES REMOVED)  
ANSWERS '1-9' FROM FILE MEDLINE  
ANSWERS '10-24' FROM FILE BIOSIS  
ANSWERS '25-28' FROM FILE AGRICOLA  
ANSWERS '29-39' FROM FILE CABA  
ANSWERS '40-49' FROM FILE HCAPLUS