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Review of Scientific Literature Relevant to the Food/Feed and Environmental Risk Assessment of Event MIR604 Maize

Literature Review

TEST GUIDELINE(S): Not Applicable

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LIST OF ACRONYMS AND ABBREVIATIONS

CAB	Commonwealth Agricultural Bureaux
EFSA	European Food Safety Authority
ERA	Environmental Risk Assessment
EU	European Union
GMO	Genetically modified organism
ISAAA	International Service for the Acquisition of Agri-Biotech Applications
MEDLINE	MEDical Literature Analysis and Retrieval System (online version)
NTO	Nontarget organisms
PICO/PECO	Population, Intervention/Exposure, Comparator, Outcomes
PMI	phosphomannose isomerase

1.0 OBJECTIVE

The purpose of this systematic literature search is to identify literature and/or information on MIR604 maize that is relevant to the risk assessment of genetically modified organisms.

Syngenta transformed maize (*Zea mays* L., corn) to produce Event MIR604 maize, which provides control of certain coleopteran insect pests. Event MIR604 maize plants contain the transgene *mcry3A*, which encodes the insecticidal protein mCry3A, and the transgene *pmi*, which encodes the enzyme phosphomannose isomerase (PMI). The native Cry3A from the soil bacterium *Bacillus thuringensis* subsp. *tenebrionis* is active against certain coleopteran pests of maize. The mCry3A produced by MIR604 was modified to have enhanced activity against the Western corn rootworm (*Diabrotica virgifera virgifera*) and other related coleopteran pests. The transgene *pmi* (also known as *manA*) was derived from *Escherichia coli* strain K-12. PMI enables transformed plant cells to utilize mannose as a primary carbon source; it was used as a selectable marker in the development of MIR604 maize. The PMI protein expressed in MIR604 maize differs from the *E.coli* PMI by two amino acids and was designated MIR604 PMI.

This report defines the 1) review question; 2) the search strategy; and 3) the explicit methods for selecting and categorizing the records. The results of the selection process are reported including consideration of the implications of any findings. This report aims to comply with the EFSA explanatory note on literature searching for GMO applications (EFSA 2019).

2.0 FORMULATING REVIEW QUESTIONS AND CLARIFYING THEIR PURPOSE

2.1 Review Question

The review question associated with this literature search was:

Do either food/feed products derived from MIR604 maize or the intended trait have adverse effects on human and/or animal health and/or the environment?

This review question follows the PICO/PECO structure with key elements “Population, Intervention/Exposure, Comparator, Outcomes” (Table 1).

TABLE 1 Review question in PICO/PECO structure

Element	Components of Review Question
Population	human and animal health and the environment
Intervention/Exposure	MIR604 maize, derived food/feed products, mCry3A and PMI and closely related variants
Comparator	conventional counterpart (if applicable)
Outcome	adverse effects

2.2 Eligibility/Inclusion Criteria

Tables 2 and 3 summarize the eligibility/inclusion criteria for establishing relevance of retrieved records. Table 2 provides high level key concepts for inclusion/exclusion and Table 3 provides more explicit information on the information/data requirements concept. The eligibility/inclusion criteria are provided in the order of importance or ease of finding information on the criteria within a publication. The first failed eligibility/inclusion criterion was used as the primary reason for exclusion, and the remaining criteria were not assessed. Internet pages results were screened by date to remove those published prior to 2019. Pages without dates were evaluated further using the criteria in Tables 2 and 3.

TABLE 2 Eligibility/Inclusion criteria to establish relevance

Concepts	Criteria	Comment
Intervention/exposure	MIR604 maize, derived food/feed products, and/or the intended trait(s)	Intended traits include Coleopteran insect resistance and mannose metabolism. The newly expressed proteins are mCry3A and PMI. Closely related variants were considered relevant and are defined as any protein sharing the same secondary level of Crickmore nomenclature with mCry3A (underlined) and any enzyme classified as a phosphomannose isomerase.
Information/data requirements	Data inform one or more information/data requirement(s) 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 MIR604 maize (information/data requirements provided in Table 3) were considered relevant. Based on the scope of the application certain information/data requirements were excluded. These are also detailed in Table 3. Publications addressing issues such as benefits, socio-economics, ethics, crop protection, detection methods, efficacy, public perception, and risk communication were excluded using this criterion, as they are not relevant to the risk assessment as defined in this document.
Scope of GMO application	The pathways and level of exposure to the GMO, derived food/feed products, and the intended trait(s) addressed in the publication are relevant for the intended uses of the GMO and derived food/feed products under regulatory review	The scope of the application associated with this literature review is import and processing for food/feed uses. Therefore, publications must address pathways and levels of exposure relevant to the scope of the application to be included.
Reporting format	Original/primary data are presented in the publication or it is a risk assessment from a relevant key organization (such as regulatory agencies and risk assessment bodies involved in the risk assessment of GMOs)	Records that do not present original/primary data (e.g. reviews, editorials, position papers) were excluded. Risk assessments performed and reported by relevant key organizations were included if they address MIR604 maize, mCry3A or closely related variants or PMI.
Previously risk assessed publications	As indicated by EFSA, a publication should be included if it has not been previously risk assessed by EFSA and/or its GMO Panel and is not cited/referenced in an EFSA/GMO Panel output	If a publication has previously been considered by EFSA it was excluded. Any cited/referenced publications contained within documents produced by EFSA and/or its GMO Panel were also excluded.
Access	Full-text document is accessible	If potentially relevant full-text documents could not be obtained, then they were listed in a table with a description of the (unsuccessful) methods that have been used to try to obtain a copy.

Concepts	Criteria	Comment
Population	Human and animal health, and/or the environment are addressed as general protection goals	All of the information/data requirements categories described in Table 3 are thought to inform the risk assessment related to human and animal health, and/or the environment. Therefore, if a publication meets the inclusion criteria described in this Table and is relevant to the information/data requirements in Table 3 it was considered relevant.
Outcomes	Effects/impacts on human and animal health, and/or the environment are addressed	Publications that address MIR604 maize 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 MIR604 maize.
Comparator	If the publication is a comparative study that uses plant material as a test material, eligible publications must report a non-GM variety	Publications that address MIR604 maize must also include a conventional counterpart as a comparator in those cases where comparative analysis is conducted and plant material is used as test material. Any uncertainties about the appropriateness of the comparator was addressed in the assessment of the publication.
Plant species	The publication addresses the same plant species as the GMO under consideration	This literature review aims at determining the safe use of the intended traits(s) of MIR604 maize. Therefore, GMOs that contain mCry3A or closely related variants or PMI, but are introduced into another plant species may be included. For certain types of data, the presence of mCry3A or PMI in a different plant species will not impact the assessment of MIR604 maize. Those types of data are identified in Table 3.
Target pest/organisms	Target pests/organisms addressed in the study are established in the EU	Records related to the intervention/exposure and target pests/organisms were excluded because the scope of the application is import for food/feed uses and this would be relevant for cultivation applications only
Reporting format	A study should only be presented once, but if it is presented in more than one publication, all publications should be listed and grouped.	Duplicate publications were excluded at the initial screening stage. Only one copy of a study was presented even if it is reported in different publications.

TABLE 3 Overview of Main Categories of Information/Data Requirements

Expert knowledge on data used in the risk assessment of the GMO is required but the list below provides some examples of relevant data/information. If certain data are considered event-specific or specific to the transgenic proteins expressed in MIR604 maize it is noted. If the record does not contain enough information to determine if the protein being evaluated is a closely related variant then it was included.

Information/data requirement	Non-exhaustive list of specific information/data requirements
Molecular characterization of the genetic modification of MIR604 maize	• Information on the insert including: sequence, size, copy number, genetic element arrangement, deletions, location, sequence similarity searches, analysis of open reading frames (MIR604 maize only) • Expression data of inserted/modified sequences (MIR604 maize only) • Genetic stability (MIR604 maize only) • Molecular and biochemical characterization of the protein(s) such as: primary structure, molecular weight, post-translational modifications (mCry3A or PMI as expressed in MIR604 maize only) • Assessment of enzymatic activity including substrate specificity and reaction products with respect to safety and/or nutritional balance • Data on the equivalence between plant-produced and microbially-produced proteins (mCry3A or PMI from MIR604 maize plants and a microbial source)
Agronomic, phenotypic and compositional characterization of the MIR604 maize	• Comparative assessment of agronomic and phenotypic characteristics under field or controlled conditions (MIR604 maize only) • Comparative analysis of key nutritional constituents (MIR604 maize only)
Toxicological assessment of newly expressed protein(s), new constituents other than proteins, and the whole GM food/feed	• Amino acid sequence comparison between toxic proteins and the newly expressed protein(s) (mCry3A or PMI as expressed in MIR604 maize only) • Stability of the protein(s) under relevant processing and storage conditions • Investigation of proteolytic susceptibility of the newly expressed proteins • Toxicity studies • Feeding studies that used plant material (MIR604 maize only)
Allergenicity assessment of the newly expressed protein and the GM food/feed, and adjuvanticity	• Amino acid sequence comparison between known allergens or celiac disease peptide sequences and the newly expressed proteins (mCry3A or PMI as expressed in MIR604 maize only) • Serum screening • Pepsin susceptibility testing • *In vivo* tests in animal models • Expression data for endogenous allergens in maize (MIR604 maize only) • Comparison of newly expressed proteins to known strong adjuvants
Nutritional assessment of the newly expressed protein(s), other new constituents, as well as potential alterations in the total diet of the consumer or the animal	• Anticipated dietary intake of food/feed from MIR604 maize and the resulting nutritional impact • Comparative growth performance studies with young rapidly growing animal species. (MIR604 maize only if the diet is manufactured from transgenic plant material)

Information/data requirement	Non-exhaustive list of specific information/data requirements
Post-market monitoring	• Description of mechanisms for determining actual changes to overall dietary intake patterns of the GM food, to what extent this has occurred and whether or not the product induces known (side) effects or unexpected side effects • Information on the reliability, sensitivity, and specificity of the post market monitoring
Persistence and invasiveness assessment, including plant-to-plant gene transfer	• Measurements of volunteer occurrence and establishment (MIR604 maize only) • Replacement capacity (MIR604 maize only) • Fitness of the GM plant expressing mCry3A or PMI in various environmental conditions – in the same or in different plant species were considered relevant
Assessment of plant to micro-organism gene transfer	• Homology searches at nucleotide level between the GM event and microorganisms. (MIR604 maize only)
Assessment of interactions with target organisms	• Excluded based on the scope of the application. The scope of this application covers the import, processing and food and feed use of MIR604 maize in the EU. According to the EFSA ERA Guidance (EFSA 2010): *"resistance development is only relevant for applications with scope cultivation of GM plants and not for applications restricted to import and processing of GM plants and their products"* (EFSA 2010). Therefore, an assessment of the potential resistance development in target organisms resulting from the import, processing and food and feed use MIR604 maize is not relevant for this application.
Assessment of interactions with nontarget organisms	• The EFSA ERA Guidance (EFSA 2010) states that: *"in cases where the application does not include cultivation in the EU, direct environmental exposure of NTOs to the GM plant is via accidental release into the environment of seeds or propagules during transportation and processing. This may result in sporadic occurrence of feral plants and therefore exposure of NTO populations is likely to be negligible. The ERA will then focus on indirect exposure to products of the GM plant (e.g. through manure and faeces from animals fed the GM plant, and other by-products of industrial processes)"*. Therefore, any publications that discuss direct exposure in test protein(s) and laboratory studies or field survey data can be considered not relevant based on scope of application.
Assessment of interactions with biogeochemical and abiotic processes	• Excluded based on the scope of the application. The scope of this application covers the import, processing and food and feed use of MIR604 maize in the EU. According to the EFSA ERA Guidance (EFSA, 2010): *"applications concerning food/feed uses and import and processing do not require scientific information on possible environmental effects associated with the cultivation of the plant*" therefore, an assessment of the impacts of MIR604 maize on biogeochemical processes resulting from specific cultivation, management and harvesting techniques is not relevant given the scope of this application.

Information/data requirement	Non-exhaustive list of specific information/data requirements
Assessment of impact of specific cultivation, management and harvesting techniques	• Excluded based on the scope of the application. The scope of this application covers the import, processing and food and feed use of MIR604 maize in the EU. Cultivation of MIR604 maize in the EU is not included in the scope. According to the EFSA ERA guidance (EFSA 2010): "*for GM plants for import and processing that are not intended for cultivation in the EU, there is no need for an ERA for altered cultivation, management and harvesting techniques*". Therefore, an assessment of impact of specific cultivation, management and harvesting techniques of MIR604 maize is not relevant for this application.
Risk mitigation	• Excluded based on the scope of the application. Risk mitigation measures such as high dose/refuge strategy, isolation distance from protected habitats hosting species of conservation concern that are at risk, integrated pest/weed management are only relevant to cultivation. The scope of this application covers the import, processing and food and feed use of MIR604 maize.
Post-market environmental monitoring	• Excluded based on the scope of the application. Monitoring such as insect resistance is relevant only to cultivation. The scope of this application covers the import, processing and food and feed use of MIR604 maize.

3.0 SEARCHING FOR/IDENTIFYING RELEVANT PUBLICATIONS

3.1 Electronic Bibliographic Databases

To search for different types of publications and unpublished work that could provide information on the review question, multidisciplinary citation databases which include grey literature (i.e., not peer reviewed) were used. Medline, Agricola, CAB Abstracts, and BIOSIS Previews (provided by Ovid Technologies) were searched. Each of the databases has a thesaurus. Searching these databases fulfills the requirement to search a minimum of at least two multi-disciplinary/large databases.

These databases were selected based on their coverage of scientific literature for relevant subjects including, but not limited to, biomedicine, plant diseases, agriculture, life sciences, pesticides, human health and nutrition, animal health, plant science, biotechnology and environmental studies. Detailed information (e.g., list of subjects covered, coverage dates, update schedule, and sources for data) regarding each of the databases searched can be obtained upon request. The document types in these databases include: journal articles, technical letters and notes, conference proceedings, book chapters, reports, and articles in press.

3.2 Internet Searches

3.2.1 Key organizations

The internet pages of regulatory agencies and risk assessment bodies listed below (Table 4) were searched for documents related to MIR604 maize.

TABLE 4 Key organizations pages included in the search

Regulatory agency/risk assessment body	Web address
Food Standards Australia New Zealand	http://www.foodstandards.gov.au/consumer/gmfood/applications/Pages/default.aspx
Health Canada[a]	https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/approved-products.html
Ministry of Agriculture, Forestry and Fisheries	http://www.maff.go.jp/e/
Ministry of Environment, Forest and Climate change	http://moef.gov.in/
National Technical Commission on Biosafety[b]	http://ctnbio.mctic.gov.br/inicio
Office of the Gene Technology Regulator	http://www.ogtr.gov.au/
US Department of Agriculture	https://www.aphis.usda.gov/aphis/ourfocus/biotechnology
US Environmental Protection Agency	https://www.epa.gov/ingredients-used-pesticide-products/current-and-previously-registered-section-3-plant-incorporated
US Food and Drug Administration	https://www.accessdata.fda.gov/scripts/fdcc/?set=Biocon

[a]Also searches Environment and Climate Change Canada (https://www.ec.gc.ca/cc/) and Canadian Food Inspection Agency (http://www.inspection.gc.ca/plants/plants-with-novel-traits/notices-of-submission/eng/1300143491851/1300143550790).
[b]Reports that reflect individual reviewer opinions are excluded from evaluation because they are considered when developing the official final opinion of the agency.

3.2.2 Web-based search engines and databases

General search engines such as GOOGLE Scholar and web-based databases known to contain information specifically on effects of GMOs were not searched. The search of the databases and key organization websites is considered to provide an adequately comprehensive search of literature.

3.2.3 Manual searches

3.2.3.1 Checking reference lists

If any reviews, methodological publications, guidelines and scientific opinions from regulatory agencies were retrieved using the search strategy and classified as relevant to the review question, then the reference lists from those records were manually searched for new records within the relevant time period (2019 through the date the search was conducted) and that meet the eligibility/inclusion criteria.

3.2.3.2 Hand searching

Hand searching was not conducted. The search of the databases and key organization websites is considered to provide an adequately comprehensive search of literature.

3.2.3.3 Citation searching

Citation searching was not conducted. The search of the databases and key organization websites is considered to provide an adequately comprehensive search of literature.

3.3 Constructing the Search Strategy

3.3.1 Database searching

3.3.1.1 Approaches to develop searches

The "lumping" approach was utilized. A single search strategy was developed to capture all categories of information of interest in one search. This strategy was used because previous experience indicates that a manageable number of studies was returned.

3.3.1.2 Search terms

Identifying search terms

Search terms were identified by:

- Assessing subject indexing terms of relevant publications recorded in those electronic bibliographic databases that use thesauri
    - All publications returned from literature search reports that aim to comply with the EFSA explanatory note and deemed relevant to the review questions were examined to determine the subject indexing terms associated with it.

- Seeking suggestions from experts and stakeholders
    - The search terms were developed using a multi-disciplinary team (i.e., risk assessors, information specialists, regulatory affairs managers).

Free-text terms and subject indexing terms

The searches with the Ovid platform utilized the keyword search in the advanced search window. The keyword search uses a default set of fields designated ".mp", which vary by database. Therefore, Ovid uses the term "keyword" to indicate that it is executing a multi-field search. In each database the specific fields searched are a different combination of free-text and controlled vocabulary fields, with Ovid switching automatically to the appropriate fields when a database is selected.[1]

In Ovid, the fields used in the .mp keyword search are word searchable, therefore any search only has to find a single word in a controlled vocabulary field that contains phrases to return as search results all references indexed to that subject heading. Thus, a search strategy which includes "genetic*" will return the following (highlighted below):

- **Genetically modified** foods or **genetic engineering** in the Subject Headings field in Agricola,
- Zea mays: species, maize, common**, genetically modified**, strain-Bt10 [Gramineae] in the Organism field in BIOSIS Previews,
- **Genetically engineered** organisms in the Subject Headings field in CAB Abstracts,
- Plants, **Genetically Modified** / ge [Genetics] or **Genetic Engineering** in MeSH Subject Headings in Medline

Subsequent combining of terms, (genetic* AND (modif* OR engineer*)) (in bold), yields all references with these headings to be in the final results for that search set. Therefore, it is not necessary to search each exact controlled phrase in order to return all references for each of the specific headings.

[1] In Agricola the .mp fields are: free-text—abstract; geographic area; identifier; meeting information; map information; note; original title; personal name as subject; title—and controlled vocabulary—category code; subject heading.
In BIOSIS Previews the .mp fields are: free-text—abstract; book title; gene name; miscellaneous descriptors; methods & equipment; original language book title; title—and controlled vocabulary—biosystematic codes; chemicals & biochemicals; concept codes; diseases; geopolitical locations; major concepts; organisms; parts, structure & systems of organisms; sequence data; super taxa; taxa notes; time.
In CAB Abstracts the .mp fields are: free-text—abstract; identifiers; original title; title—and controlled vocabulary—broad terms; geographic location; organism descriptors; subject headings.
In Medline the .mp fields are: free-text—abstract; keyword heading word; original title; synonyms; title; unique identifier—and controlled vocabulary—floating sub-heading word; name of substance word; organism supplementary concept word; protocol supplementary concept word; rare disease supplementary concept word; subject heading word.

Appendix A provides 1) the search history (including the full strategy used and fields searched as run in the database) and number of publications identified (line by line) for each bibliographic database prior to de-duplication and 2) the subject indexing used by each database as shown within the brackets after each search term.

3.3.1.3 Free-text searching functions

The search terms were selected to incorporate a wide variety of synonymous and related terms. Truncation and wildcards were used where appropriate to capture different conventions in spelling and variation in the endings of terms.

3.3.1.4 Search strings

Search strings were combined with Boolean and proximity operators appropriate for the scope of the review.

3.3.1.5 Key elements of review questions to use for best result

A very large number of publications were returned using only the four key elements of Event, Intended trait, newly expressed protein(s), and Trade Name. To prevent a very large number of publications from being returned while still achieving sensitivity, additional key elements were added to the search strategy. Sensitivity was defined as the ability to return the previously deemed relevant articles with the new search string. 'A very large number' is not defined in the Explanatory Note (EFSA 2019); however, the number returned with other search strategies (e.g., (Event OR Intended Trait OR Newly Expressed Protein(s) OR Trade Name) or (Event OR Trade name OR ((Intended Trait OR Newly Expressed Protein(s)) AND (Plant Species or GMO)))) was so large that it could not be de-duplicated by the search platform.

Therefore, the search structure included the following search concepts/key elements: Event, Trade Name, Newly Expressed Protein(s), or Intended Trait in the same publications as terms describing plant species and/or GMO general terms. The search strategy employed was:

- Event OR Trade name OR (Newly Expressed Protein(s) AND (GMO general OR Plant Species)) OR (Intended Trait – Insecticidal AND (GMO general AND Plant Species)) OR GMO general × Intended Traits

The search strategy employed captured literature relevant to MIR604 maize and is provided in Table 5. The same search string was used in all databases. Since the Ovid search platform simultaneously searches free-text and subject headings there is no disadvantage to using all search terms in all databases. For example, if 'Genetically engineered organisms' is a subject heading in CAB Abstracts but not in Agricola including this term in the search of the Agricola databases still allows for free-text searching of this term.

TABLE 5 Search string strategy

Set	Field	Search string	Concepts/Key elements
1	Topic	MIR604 OR MIR 604 OR SYN-IR6?4-5	Event MIR604
2	Topic	Agrisure* ADJ2 RW*	Trade name for Event MIR604
3	Topic	mCry3A* OR mCry 3A* OR mCry 3 A* OR Cry3A* OR Cry 3A* OR Cry 3 A*	Newly expressed protein in MIR604
4	Topic	Phosphomannoisomerase OR Mannose 6-phosphate isomerase OR Phosphomannoseisomerase OR Phosphomannose isomerase OR 9023-88-5 OR AAA24109 OR EC 5.3.1.8 OR E.C. 5.3.1.8	Newly expressed protein in MIR604 (selectable marker)
5		#3 OR #4	
6	Topic	((Insect OR Insects OR coleoptera* OR pest OR pests OR rootworm* OR root worm* OR Diabrotica OR D virgifera OR D barberi OR MCR OR MCRW OR NCRW OR WCRW OR WCR) ADJ2 (toleran* OR resistan* OR protect* OR control*)) OR Bacillus thuringiensis OR B thuringiensis	Intended traits (insecticidal)
7	Topic	GMO* OR LMO* OR GM OR GE OR transgen* OR ((genetic* OR living OR biotech*) ADJ3 (modif* OR transform* OR manipulat* OR improv* OR engineer* OR deriv*))	GMO general
8	Topic	Maize* OR corn* OR Zea mays OR Z mays	Plant species
9	Topic	((Bt OR Bacillus thuringiensis OR B thuringiensis) ADJ5 (maize* OR corn* OR mays)) OR Btmaize* OR Btcorn*	GMO general × intended traits
10		#5 AND (#7 OR #8)	Newly expressed proteins AND (GMO general OR plant species)
11		#6 AND (#7 AND #8)	Intended trait- insecticidal AND (GMO general AND Plant species)
12		#1 OR #2 OR #10 OR #11 OR #9	Event OR Trade name OR (Newly expressed proteins AND (GMO general OR plant species)) OR (Intended trait -insecticidal AND (GMO general AND Plant species)) OR GMO general x intended traits

3.3.1.6 Use of multiple languages

The search terms used were in the English language or utilized the Roman alphabet. For the event name and trade name it is unlikely that there are translations because they are not words in the English language.

3.3.1.7 Time period

Due to the use of multiple (i.e., 4) multi-disciplinary databases and redundancy in coverage it is unlikely that late addition of a publication would be missed. Therefore, the returned literature was limited to that which was published between January 1, 2019 (Ovid only allows for limiting search by year) and the date of the last database update prior to the search.

The records returned from the search of the regulatory agency webpages were manually excluded if they were dated prior to 2019. If a date could not be determined for the record then the record was reviewed for relevance using the criteria in Tables 2 and 3.

3.3.1.8 Internet searching of regulatory agency webpages

The search terms selected are the event and protein names from the International Service for the Acquisition of Agri-Biotech Applications (ISAAA) (Table 6). The descriptions and information for the top 50 hits or 10% of the total hits (whichever is greater) for each search term/web page were collected.

TABLE 6 Nomenclature for the single event and newly expressed protein(s) from the ISAAA database for use in searching regulatory agency web pages

Event	Search term	Concepts/Key elements
MIR604	MIR604	Event name
MIR604	mCry3A	Newly expressed protein
MIR604	Phosphomannose isomerase	Newly expressed protein

3.4 Reference Publications

The search strategy is the same as the one that was previously validated with reference publications ([redacted]. 2019).

4.0 SUMMARIZING AND REPORTING THE DATA, AND CONSIDERING THE IMPLICATIONS OF THE FINDINGS

4.1 Selecting Publications

4.1.1 Database records

The process for selecting relevant publications was conducted in two stages. The first stage required a rapid assessment of titles and abstracts. Those records that were clearly not relevant from reviewing the title only were excluded from further review. For those records that appeared relevant or had unclear relevance the abstracts were reviewed. Those records that were clearly not relevant from reviewing the abstract were excluded from further review, while records that are relevant or have unclear relevance were reviewed in Stage 2.

Full-length articles were reviewed in Stage 2. An explanation of exclusion is provided for any full-length records that were deemed irrelevant in Stage 2. Any relevant records identified in Stage 2 were subjected to a reliability assessment and evaluation of the implications of the record on the food and feed or environmental risk assessments.

Two independent reviewers examined the records for inclusion/exclusion for each eligible information/data requirement at all stages of review. Reviews and selections were conducted independently. During the rapid assessment process (Stage 1), only records that were deemed clearly not relevant by both reviewers were excluded from further review. This

conservative approach ensures that all potentially relevant records are evaluated until they are deemed to be either relevant or clearly irrelevant in Stage 2. Following the Stage 1 reviews, reviewers scored the records as either 1) relevant or unclear relevance, 2) clearly irrelevant.

A kappa test was performed after the Stage 1 review and before any discussion of abstracts over which there was disagreement by the reviewers. Of the 202 records reviewed from the databases at Stage 1 there were 200 agreements to exclude, 0 records where both reviewers agreed to include it for Stage 2 review, and 2 disagreements: for one record reviewer A selected to include it while reviewer B selected to exclude; for one record reviewer A selected to exclude it while reviewer B selected to include. This yielded a kappa test score of 0.

Subsequently, the reviewers met to discuss the abstracts in which they disagreed and moved both records over which there was disagreement forward to full-length review in Stage 2. There was no disagreement among the reviewers after Stage 2 therefore no tie breaker review was needed.

Because of the format of document retrieved from internet searching of key organizations (i.e., title and abstract is not often provided) the kappa test was conducted only on the output of the database search.

4.1.2 Records from key organizations

The records returned from searching the websites of key organizations were considered relevant if they were risk assessments, scientific opinions/reports concerning the commercial release of GMO being examined or documents on the biology of the crop of interest. The regulatory agency webpages that were searched do not post primary data; therefore all other document types are not considered relevant.

The format of records returned from regulatory agency websites did not meet the format required to assess them using the two stage process followed for the database records. Those websites where the records are published in English were assessed by two independent reviewers. Due to format full-text documents were assessed to determine relevance. For those websites where the records are not published in English, the results were reviewed by a native speaker. If the document was deemed to be a relevant document type then it was translated into English and two independent reviewers determined if it met the criteria for inclusion. The rationale for record exclusion is provided only if the record was classified as a relevant document type and was then excluded based on other eligibility criteria.

The Intersecretarial Commission on Biosafety of GMOs and National Advisory Commission on Agricultural Biotechnology do not post the relevant document types on their websites; therefore those agency websites were not searched.

For the purposes of generating the statistics related to the records returned from the search of the regulatory agency websites certain assumptions were made. A unique internet record was defined as a unique URL. If the URLs for two documents were identical except for the file format (e.g., pdf versus .doc or .docx), one of the documents was considered a duplicate and excluded from statistical accounting. Documents that were classified as relevant were manually examined to determine if there were any duplicates among them. If a duplicate was identified then it was excluded.

Documents that are clearly labeled as draft or with a line for a signature that is blank were not reviewed for relevance.

4.2 Results of the Publication Selection Process

For electronic bibliographic databases, the date on which the search was conducted, the date of the most recent update of the database, the service provider used, date span of the search, any limits applied to the search (e.g., study types, dates, languages) and the total number of records retrieved before and after removing duplicates were recorded (Table 7). Additionally, the line by line strategy with the number of publications identified per line is presented. See Appendix A.

TABLE 7 Electronic bibliographic database search details

Database	Search date (dd/mm/yyyy)	Service provider	Date span of the search (dd/mm/yyyy)[a]	Any limits applied to the search	Total number of records retrieved after removing duplicates
Agricola	07/07/2020	Ovid Technologies	01/01/2019 to 30/06/2020	Dates	0
BIOSIS Previews	07/07/2020	Ovid Technologies	01/01/2019 to 05/07/2020	Dates	61
CAB Abstracts	07/07/2020	Ovid Technologies	01/01/2019 to 05/07/2020	Dates	54
Medline	07/07/2020	Ovid Technologies	01/01/2019 to 06/07/2020	Dates	87

[a]Ovid only allows results to be limited by year. The results were de-duplicated across databases. The frequency of database update varies. Ovid has provided us with the following update information: Agricola updated monthly on the 1st of the month, BIOSIS Previews updated weekly on Mondays, CAB Abstracts updated weekly on Mondays and Medline updated daily.

For records from websites the following were recorded (if available): the website name and service publisher used, justification for choosing the source, the URL, the date on which the search was conducted, the date of the most recent website update at the time it was searched, the date span of the search, the search terms used, any limits to the search, and the number of relevant records retrieved (Table 8).

Table 6 contains the search terms used as a series of single searches for regulatory agency web pages.

The one relevant record returned from the regulatory agency website search did not contain any references so a manual search returned no additional records.

TABLE 8 Regulatory agency webpage search details

Regulatory agency name	URL	Date of search (dd/mm/yyyy)	Date of most recent website update	Date span of search[a]	Total number of records retrieved after removing duplicates	Number of relevant records
US Environmental Protection Agency	https://www.epa.gov/ingredients-used-pesticide-products/current-and-previously-registered-section-3-plant-incorporated	05/08/2020	14/07/2020	No limitations	0	0
US Department of Agriculture	https://www.aphis.usda.gov/aphis/ourfocus/biotechnology	04/08/2020 03/08/2020	No update information provided	No limitations	2	0
US Food and Drug Administration	https://www.accessdata.fda.gov/scripts/fdcc/?set=Biocon	31/07/2020	11/10/2019	No limitations	0	0
Health Canada	https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/approved-products.html	29/07/2020	28/05/2020	No limitations	1	0
Food Standards Australia New Zealand	http://www.foodstandards.gov.au/consumer/gmfood/applications/Pages/default.aspx	27/07/2020 23/07/2020 24/07/2020	No update information provided	No limitations	4	1
Office of the Gene Technology Regulator	http://www.ogtr.gov.au/	23/07/2020	23/07/2020	No limitations	1	0
National Technical Commission on Biosafety	http://ctnbio.mctic.gov.br/inicio	15/07/2020	No update information provided	No limitations	1	0
Ministry of Environment, Forest and Climate change	http://moef.gov.in/	23/07/2020	No update information provided	No limitations	0	0
Ministry of Agriculture, Forestry and Fisheries	http://www.maff.go.jp/e/	20/07/2020	No update information provided	No limitations	1	0

[a]Records published prior to 2019 were manually excluded (if any).

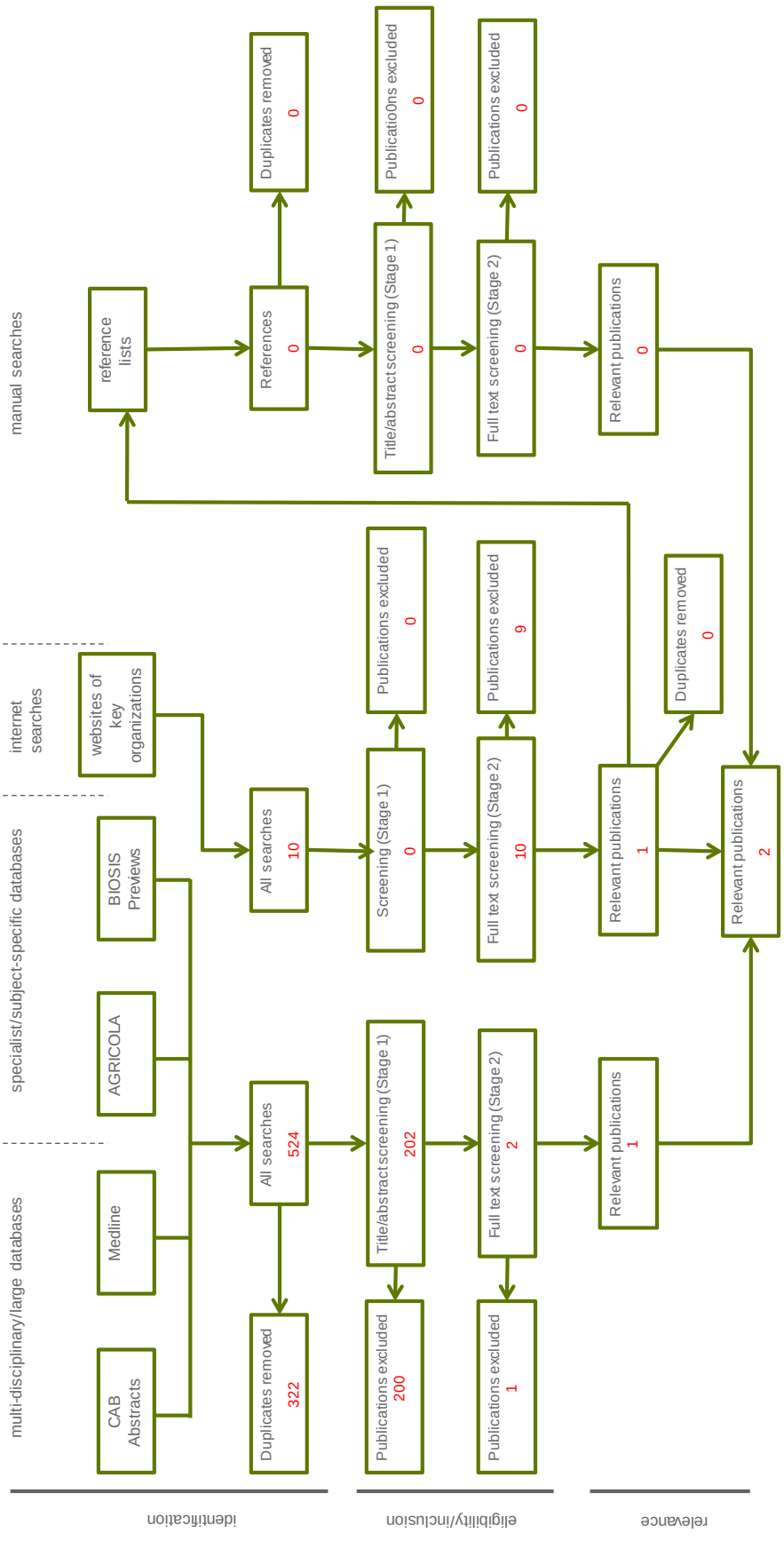
The results of the selection process are recorded in Table 9 and a flow chart of the publication selection process is shown in Figure 1.

TABLE 9 Results of the publication selection process, for each review question and or group of information/data requirements searched

Review question and/or category of information/data requirement(s) captured in the search	Number of publications
Publications identified after all[a] searches of the scientific literature (excluding duplicates)	212
Database results identified	202
Internet results identified	10
Manual search – checking reference lists[b]	0
Publications excluded from the search results after screening of title and abstracts[c] (stage 1)	200
Database results excluded	200
Internet results excluded	0
Manual search – reference results excluded	0
Publications screened using full-text (stage 2)	12
Database results screened	2
Internet results screened	10
Manual search – reference results screened	0
Publications excluded after full-text screening	10
Database results full-text excluded	1
Internet results full-text excluded	9
Manual search – references excluded	0
Unobtainable publications	0
Unclear publications	0
Publications considered relevant	2
Database results relevant	1
Internet results relevant	1
Manual search – relevant references	0

[a]Both from electronic bibliographic databases and other sources of scientific literature.
[b]No relevant records were returned from the searching of regulatory agency websites therefore there are no references to evaluate via manual searching.
[c]Due to the formatting of records from the websites of key organizations (i.e. a lack of abstracts and in some cases titles) these records were reviewed in a single stage in which the full-text document was reviewed.

FIGURE 1 Flow chart of the publication selection process



4.3 Relevant Publications

A list of the full bibliographic references for all relevant publications, ordered by category of information/data requirement is recorded in Table 10 and 11.

TABLE 10 Report of all relevant publications retrieved after detailed assessment of full-text documents for relevance: ordered by category of information/data requirement(s)

List of bibliographic references for all relevant publications, classified by category of information/data requirements			
Category of information/data requirement(s)	**Study author(s) and year**	**Title**	**Source**
Molecular characterisation of the genetic modification of GMO	Walters *et al.* 2020	Meeting technical challenges for protein characterization and surrogate equivalence studies that resulted from insecticidal protein co-expression in maize event MZIR098.	Transgenic Research

TABLE 11 Report of all relevant publications retrieved after assessment of internet documents

List of bibliographic references for all relevant publications, classified by category of information/data requirements			
Category of information/data requirement(s)	**Study author(s) and year**	**Title**	**Source**
Risk Assessment	Corteva Agroscience 2020	Application to Amend the Food Standards Code – Food Produced Using Gene Technology OECD Unique Identifier – DP-Ø23211-2	https://www.foodstandards.gov.au/code/applications/Documents/A1202%20Executive%20Summary_Redacted.pdf

4.4 Excluded Publications After Detailed Assessment of Full-Text Documents

A list of the full bibliographic references for all excluded studies excluded after detailed assessment of full-text documents for relevance (i.e., stage 2), with justification for their exclusion, is recorded in Table 12 (databases) and Table 13 (internet records).

TABLE 12 Report of all publications excluded after detailed assessment of full-text documents

List of bibliographic references for all relevant publications excluded classified by authors			
Study author(s) and year	**Title**	**Source**	**Reason(s) for exclusion based on eligibility/inclusion criteria**
Dively *et.al.* 2020	Evaluation of gene flow in structured and seed blend refuge systems of non-Bt and Bt corn	Journal of Pest Science	Intervention/exposure - This study was performed on Agrisure 3000GT which is a breeding stack, and not the single event MIR604 maize.

TABLE 13 Report of all publications excluded after detailed assessment of full-text internet documents

List of bibliographic references for all relevant publications excluded classified by authors			
Study Author(s) and year	**Title**	**Source**	**Reason(s) for exclusion based on eligibility/inclusion criteria**
Agrivida, Inc. 2019	Petition for the Determination of Nonregulated Status of Maize Event PY203	https://www.aphis.usda.gov/brs/aphisdocs/19_17601p.pdf	Information/data requirements
BASF 2019	Application to FSANZ to Vary Food Standard 1.5.2 to Include the Nematode Resistant and Herbicide Tolerant Soybean (*Glycine max*) Event GMB151	https://www.foodstandards.gov.au/code/applications/Documents/A1196%20Application.pdf	Intervention/exposure

The other 7 records excluded and not presented in this table did not fulfill the eligibility criteria for report format.

4.5 Unobtainable Publications

No publications were considered unobtainable.

4.6 Unclear Publications

No publications were classified as unclear.

4.7 Full-Text Documents

Full text documents for all relevant publications were compiled using a reference management software (.RIS format) and accompany this final report.

4.8 Narrative Synthesis/Summary of Relevant Publications

A narrative synthesis/summary of the relevant studies describing their overall volume, strength and direction per main category of information/data requirements was not reported because this literature review was conducted for annual PMEM reports on GMOs authorized in the EU market and therefore it is not required.

4.9 Implications of Relevant Publications on Risk Assessment

The implications of the relevant publications on the risk assessment was assessed by considering whether the record presents new hazards, modified exposure pathways or new scientific uncertainties.

The record reliability and its implication on the risk assessment are recorded in Tables 14 and 15.

TABLE 14 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)

List of bibliographic references for all relevant publications, classified by category of information/data requirements			
Category of information/data requirement(s)	**Publication author(s) and year**	**Summary of reliability appraisal**	**Implications for the risk assessment**
Molecular characterization of the genetic modification of GMO	Walters *et al*. 2020	High – use as a key study	This record summarizes data that characterizes mCry3A. The information provided in this publication does not change the conclusion of the risk assessment for MIR604 maize.

TABLE 15 Report of the reliability and implications for the risk assessment of all relevant publications retrieved after assessment of internet documents.

List of bibliographic references for all relevant publications, classified by category of information/data requirements			
Category of information/data requirement(s)	**Publication author(s) and year**	**Summary of reliability appraisal**	**Implications for the risk assessment**
Risk assessment or scientific opinion	Corteva Agroscience 2020	Not assignable because no or insufficient information is reported in the document	This document summarizes data on PMI. The information provided in this document does not change the conclusion of the risk assessment for MIR604 maize.

5.0 RECORDS TO BE MAINTAINED

Records maintained include, but are not be limited to, documentation of database search dates, database update dates, resolution of differences of opinion on records, the protocol, and any protocol amendments or deviations.

6.0 ARCHIVING OF STUDY RECORDS

The protocol amendments, deviations, raw data, related documentation, and final report are archived at Syngenta in Research Triangle Park, NC, USA.

7.0 REFERENCES

Agrivida, Inc. 2019. Petition for the Determination of Nonregulated Status to Maize Event PY203. https://www.aphis.usda.gov/brs/aphisdocs/19_17601p.pdf

BASF. 2019. Application to FSANZ to Vary Food Standard 1.5.2 to Include the Nematode Resistant and Herbicide Tolerant Soybean (*Glycine max*) Event GMB152. https://www.foodstandards.gov.au/code/applications/Documents/A1196%20Application.pdf

[redacted] 2019. Review of Scientific Literature Relevant to the Food/Feed and Environmental Risk Assessment of Event MIR604 Maize. Report No. TK0457693.

Corteva Agroscience. 2020. Application to Amend the Food Standards Code – Food Produced Using Gene Technology OECD Unique Identifier – DP-Ø23211-2. https://www.foodstandards.gov.au/code/applications/Documents/A1202%20Executive%20Summary_Redacted.pdf

Dively GP, Huang F, Oyediran I, Burd T, Morsello S. 2020. Evaluation of gene flow in structured and seed blend refuge systems on non-Bt and Bt corn. *J Pest Sci* 93:439-447.

EFSA. 2010. Scientific Opinion on the environmental risk assessment of genetically modified plants. *The EFSA Journal* 8:1-111.

EFSA. 2019. 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 authorized in the EU market. EFSA supporting publications 2019:EN-1614.

Walters FS, Young S, Graser G. 2020. Meeting technical challenges for protein characterization and surrogate equivalence studies that resulted from insecticidal protein co-expression in maize event MZIR098. Transgenic Research 29:109-124.

APPENDICES SECTION

APPENDIX A Search history and subject indexing

Ovid® Wolters Kluwer

My Account | Ask your Information Specialist | Support & Training | Help | Feedback | Logged in as [redacted] | Logoff

Search | My Workspace

▼ **Search History** (88) View Saved

	# ▲	Searches	Results	Type	Actions	Annotations
☐	1	MIR604.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	22	Advanced	Display Results | More	🗨
☐	2	MIR 604.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	2	Advanced	Display Results | More	🗨
☐	3	SYN-IR6?4-5.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	4	1 or 2 or 3	24	Advanced	Display Results | More	🗨
☐	5	(Agrisure* adj2 RW*).mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	6	mCry3A*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	26	Advanced	Display Results | More	🗨
☐	7	mCry 3A*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	8	mCry 3 A*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	9	Cry3A*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	139	Advanced	Display Results | More	🗨
☐	10	Cry 3A*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1	Advanced	Display Results | More	🗨
☐	11	Cry 3 A*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	12	6 or 7 or 8 or 9 or 10 or 11	161	Advanced	Display Results | More	🗨
☐	13	Phosphomannoisomerase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	3	Advanced	Display Results | More	🗨
☐	14	Mannose 6-phosphate isomerase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	41	Advanced	Display Results | More	🗨
☐	15	Phosphomannoseisomerase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	16	Phosphomannose isomerase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	108	Advanced	Display Results | More	🗨
☐	17	9023-88-5.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	18	AAA24109.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	🗨
☐	19	"EC 5.3.1.8".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	4	Advanced	Display Results | More	🗨
☐	20	"E.C. 5.3.1.8".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	4	Advanced	Display Results | More	🗨
☐	21	13 or 14 or 15 or 16 or 17 or 18 or 19 or 20	143	Advanced	Display Results | More	🗨
☐	22	12 or 21	304	Advanced	Display Results | More	🗨
☐	23	Insect.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	183086	Advanced	Display Results | More	🗨
☐	24	Insects.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	236030	Advanced	Display Results | More	🗨
☐	25	coleoptera*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	39494	Advanced	Display Results | More	🗨
☐	26	pest.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	68759	Advanced	Display Results | More	🗨

Contract

☐	27	pests.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	337975	Advanced	Display Results | More	
☐	28	rootworm*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1480	Advanced	Display Results | More	
☐	29	root worm*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	42	Advanced	Display Results | More	
☐	30	Diabrotica.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1882	Advanced	Display Results | More	
☐	31	D virgifera.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	61	Advanced	Display Results | More	
☐	32	D barberi.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	52	Advanced	Display Results | More	
☐	33	MCR.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	996	Advanced	Display Results | More	
☐	34	MCRW.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1	Advanced	Display Results | More	
☐	35	NCRW.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
☐	36	WCRW.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
☐	37	WCR.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	219	Advanced	Display Results | More	
☐	38	23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37	461948	Advanced	Display Results | More	
☐	39	toleran*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	108997	Advanced	Display Results | More	
☐	40	resistan*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	277758	Advanced	Display Results | More	
☐	41	protect*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	263270	Advanced	Display Results | More	
☐	42	control*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	936190	Advanced	Display Results | More	
☐	43	39 or 40 or 41 or 42	1403078	Advanced	Display Results | More	
☐	44	((Insect or Insects or coleoptera* or pest or pests or rootworm* or root worm* or Diabrotica or D virgifera or D barberi or MCR or MCRW or NCRW or WCRW or WCR) adj2 (toleran* or resistan* or protect* or control*)).mp.	117010	Advanced	Display Results | More	
☐	45	Bacillus thuringiensis.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	10329	Advanced	Display Results | More	
☐	46	B thuringiensis.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1644	Advanced	Display Results | More	
☐	47	44 or 45 or 46	124232	Advanced	Display Results | More	
☐	48	GMO*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1399	Advanced	Display Results | More	
☐	49	LMO*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	527	Advanced	Display Results | More	
☐	50	GM.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	7385	Advanced	Display Results | More	
☐	51	GE.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	5335	Advanced	Display Results | More	
☐	52	transgen*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	50741	Advanced	Display Results | More	
☐	53	genetic*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	614601	Advanced	Display Results | More	
☐	54	living.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	55362	Advanced	Display Results | More	
☐	55	biotech*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	36594	Advanced	Display Results | More	

☐	56	53 or 54 or 55	692448	Advanced	Display Results | More	
☐	57	modif*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	236146	Advanced	Display Results | More	
☐	58	transform*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	169512	Advanced	Display Results | More	
☐	59	manipulat*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	38470	Advanced	Display Results | More	
☐	60	improv*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	501851	Advanced	Display Results | More	
☐	61	engineer*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	140138	Advanced	Display Results | More	
☐	62	deriv*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	286537	Advanced	Display Results | More	
☐	63	57 or 58 or 59 or 60 or 61 or 62	1181324	Advanced	Display Results | More	
☐	64	((genetic* or living or biotech*) adj3 (modif* or transform* or manipulat* or improv* or engineer* or deriv*)).mp.	57945	Advanced	Display Results | More	
☐	65	48 or 49 or 50 or 51 or 52 or 64	101863	Advanced	Display Results | More	
☐	66	Maize*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	65643	Advanced	Display Results | More	
☐	67	corn*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	129054	Advanced	Display Results | More	
☐	68	Zea mays.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	49676	Advanced	Display Results | More	
☐	69	Z mays.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	345	Advanced	Display Results | More	
☐	70	66 or 67 or 68 or 69	169500	Advanced	Display Results | More	
☐	71	Bt.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	6359	Advanced	Display Results | More	
☐	72	Bacillus thuringiensis.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	10329	Advanced	Display Results | More	
☐	73	B thuringiensis.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1644	Advanced	Display Results | More	
☐	74	71 or 72 or 73	13573	Advanced	Display Results | More	
☐	75	maize*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	65643	Advanced	Display Results | More	
☐	76	corn*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	129054	Advanced	Display Results | More	
☐	77	mays.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	49852	Advanced	Display Results | More	
☐	78	75 or 76 or 77	169630	Advanced	Display Results | More	
☐	79	((Bt or Bacillus thuringiensis or B thuringiensis) adj5 (maize* or corn* or mays)).mp.	1184	Advanced	Display Results | More	
☐	80	Btmaize*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1	Advanced	Display Results | More	
☐	81	Btcorn*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
☐	82	79 or 80 or 81	1185	Advanced	Display Results | More	
☐	83	65 or 70	264846	Advanced	Display Results | More	
☐	84	22 and 83	167	Advanced	Display Results | More	
☐	85	65 and 70	6517	Advanced	Display Results | More	
☐	86	47 and 85	1470	Advanced	Display Results | More	
☐	87	4 or 5 or 82 or 84 or 86	1884	Advanced	Display Results | More	
☐	88	limit 87 to yr="2019 -Current"	61	Advanced	Display Results | More	

Save | Remove | Combine with: AND | OR

Save All | Edit | Create RSS | View Saved

Basic Search | Find Citation | Search Tools | Search Fields | **Advanced Search** | Multi-Field Search

1 Resource selected | Hide | Change

AGRICOLA 1970 to June 2020

Enter keyword or phrase (* or $ for truncation) — **Keyword** | Author | Title | Journal — Search

▸ **Limits** *(expand)* — Map Term to Subject Heading

Options ◂ | Print | Email | Export | + My Projects | Keep Selected

All | Range | Clear | 5 Per Page | 1 | Go | Next ›

View By

Text (61 Results)

Multimedia (0 Results)

Search Information

You searched:

limit 87 to yr="2019 -Current"

Search terms used:

3
604
9023-88-5
aaa24109
agrisure*
b
thuringiensis
bacillus
biotech*
bt
btcorn*
btmaize*
coleoptera*
control*
corn*
cry
a*
3a*
cry3a*
d
barberi
virgifera
deriv*
diabrotica
e.c.
5.3.1.8
ec
engineer*
ge
genetic*
gm
gmo*
improv*
insect
insects
living
lmo*
maize*
manipulat*

1. **Effect of Bt Corn (Bt 38) Cultivation on Community Structure of Collembola**

Chang, Liang Song, Xinyuan Wang, Baifeng Wu, Donghui Reddy, Gadi V. P.

Annals of the Entomological Society of America. 2019 July 30. 113(1) p. 1-5.

[Journal Article. Government Publication]

AN: IND606909862.

Abstract | Cite | + My Projects | + Annotate

Abstract Reference | Complete Reference | Find Similar | Find Citing Articles | Obtain Full Text branchOUT

2. **Management of Euxesta spp. in Sweet Corn with McPhail Traps**

Lopes, S R Cruz, I

Neotropical entomology. 2020 Feb. 49(1) p. 139-146.

[Journal Article. Government Publication]

AN: IND606847612.

Abstract | Cite | + My Projects | + Annotate

Abstract Reference | Complete Reference | Find Similar | Find Citing Articles | Obtain Full Text branchOUT

3. **Molecular characterization of Cry1F resistance in fall armyworm, Spodoptera frugiperda from Brazil**

Boaventura, Debora Ulrich, Julia Lueke, Bettina Bolzan, Anderson Okuma, Daniela Gutbrod, Oliver Geibel, Sven Zeng, Qin Dourado, Patrick M. Martinelli, Samuel Flagel, Lex Head, Graham Nauen, Ralf

Insect biochemistry and molecular biology. 2020 Jan. 116(116)

[Journal Article. Government Publication]

AN: IND606764488.

Abstract | Cite | + My Projects | + Annotate

Abstract Reference | Complete Reference | Find Similar | Find Citing Articles | Obtain Full Text branchOUT

4. **Efficient Biolistic Transformation of Immature Citrus Rootstocks Using Phosphomannose-isomerase Selection**

Wu, Hao Acanda, Yosvanis Canton, Michel Zale, Janice

Plants. 2019 Sept. 30. 8(10)

Abstract Reference | Complete Reference | Find Similar

mannose
6-phosphate
isomerase
mays
mcr
mcrw
mcry
mcry3a*
mir
mir604
modif*
ncrw
pest
pests
phosphomannoisomerase
phosphomannose
phosphomannoseisomerase
protect*
resistan*
root
worm*
rootworm*
rw*
syn-ir6?4-5
toleran*
transform*
transgen*
wcr
wcrw
z
zea

Search Returned:
61 text results

Sort By:
-

Customize Display

Filter By

Add to Search History

Selected Only (0)

▼ Years
All Years
Current year
Past 3 years
Past 5 years
► Specific Year Range

► Subject
► Author
► Journal
► Publication Type

My Projects

+ New Project

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G. Montezano, Del□bora Hunt, Thomas E. Specht, Alexandre C. Luz, Priscila M. Peterson, Julie A.

Insects. 2019 Oct. 13. 10(10)

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Journal of Applied Entomology. 144(5). JUN 2020.

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☐	64	((genetic* or living or biotech*) adj3 (modif* or transform* or manipulat* or improv* or engineer* or deriv*)).mp.	143373	Advanced	Display Results | More	
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☐	80	Btmaize*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
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1. ***Bt* maize genotypes do not harm *Trichogramma pretiosum* when exposed to vegetative and reproductive structures.**
Spagnol, D. Castilhos, R. V. Pasini, R. A. Grützmacher, A. D. Rosa, A. P. S. A. da
Biocontrol Science and Technology; 2020. 30(5):480-484. 10 ref.
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3. **Results from ten years of post-market environmental monitoring of genetically modified MON 810 maize in the European Union.**
Bertho, L. Schmidt, K. Schmidtke, J. Brants, I. Cantón, R. F. Novillo, C. Head, G.
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4. **Assessment of genetically modified maize MON 88017 for renewal authorisation under Regulation (EC) No 1829/2003 (application EFSA - GMO -RX -014).**
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. Nogué, F. Rostoks, N. Serrano, J. J. S. Savoini, G. Veromann, E. Veronesi, F. Álvarez, F. Ardizzone, M. Raffaello, T.
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☐	10	Cry 3A*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2	Advanced	Display Results | More	🗨
☐	11	Cry 3 A*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	3	Advanced	Display Results | More	🗨
☐	12	6 or 7 or 8 or 9 or 10 or 11	185	Advanced	Display Results | More	🗨
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		concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]				
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☐	15	Phosphomannoseisomerase.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	5	Advanced	Display Results | More	
☐	16	Phosphomannose isomerase.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	250	Advanced	Display Results | More	
☐	17	9023-88-5.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	0	Advanced	Save | More	
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☐	19	"EC 5.3.1.8".mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	18	Advanced	Display Results | More	
☐	20	"E.C. 5.3.1.8".mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	18	Advanced	Display Results | More	
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☐	23	Insect.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	124179	Advanced	Display Results | More	
☐	24	Insects.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	47978	Advanced	Display Results | More	
☐	25	coleoptera*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	18954	Advanced	Display Results | More	
☐	26	pest.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	31176	Advanced	Display Results | More	
☐	27	pests.mp. [mp=title, abstract, original title, name of substance	11919	Advanced	Display Results | More	

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☐	29	root worm*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	3	Advanced	Display Results | More	
☐	30	Diabrotica.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	570	Advanced	Display Results | More	
☐	31	D virgifera.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	25	Advanced	Display Results | More	
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☐	33	MCR.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	4488	Advanced	Display Results | More	
☐	34	MCRW.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	0	Advanced	Save | More	
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☐	37	WCR.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	240	Advanced	Display Results | More	
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☐	47	44 or 45 or 46	35354	Advanced	Display Results | More	
☐	48	GMO*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1963	Advanced	Display Results | More	
☐	49	LMO*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2381	Advanced	Display Results | More	
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☐	51	GE.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	18964	Advanced	Display Results | More	
☐	52	transgen*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	215577	Advanced	Display Results | More	
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☐	54	living.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	393132	Advanced	Display Results | More	
☐	55	biotech*.mp. [mp=title, abstract, original title, name of substance	66597	Advanced	Display Results | More	

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☐	58	transform*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	610791	Advanced	Display Results | More	
☐	59	manipulat*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	196755	Advanced	Display Results | More	
☐	60	improv*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2508059	Advanced	Display Results | More	
☐	61	engineer*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	259940	Advanced	Display Results | More	
☐	62	deriv*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1942735	Advanced	Display Results | More	
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☐	64	((genetic* or living or biotech*) adj3 (modif* or transform* or manipulat* or improv* or engineer* or deriv*)).mp.	154809	Advanced	Display Results | More	
☐	65	48 or 49 or 50 or 51 or 52 or 64	399047	Advanced	Display Results | More	
☐	66	Maize*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	31072	Advanced	Display Results | More	
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☐	68	Zea mays.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	36010	Advanced	Display Results | More	
☐	69	Z mays.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	355	Advanced	Display Results | More	
☐	70	66 or 67 or 68 or 69	243952	Advanced	Display Results | More	
☐	71	Bt.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol	14630	Advanced	Display Results | More	

		supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]				
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1. **Genetic structure and insecticide resistance characteristics of fall armyworm populations invading China.**

Zhang L; Liu B; Zheng W; Liu C; Zhang D; Zhao S; Li Z; Xu P; Wilson K; Withers A; Jones CM; Smith JA; Chipabika G; Kachigamba DL; Nam K; d'Alencon E; Liu B; Liang X; Jin M; Wu C; Chakrabarty S; Yang X; Jiang Y; Liu J; Liu X; Quan W; Wang G; Fan W; Qian W; Wu K; Xiao Y.

Molecular Ecology Resources. 2020 Jul 03.

[Journal Article]

UI: 32619331

Authors Full Name
Zhang, Lei; Liu, Bo; Zheng, Weigang; Liu, Conghui; Zhang, Dandan; Zhao, Shengyuan; Li, Zaiyuan; Xu, Pengjun; Wilson, Kenneth; Withers, Amy; Jones, Christopher M; Smith, Judith A; Chipabika, Gilson; Kachigamba, Donald L; Nam, Kiwoong; d'Alencon, Emmanuelle; Liu, Bei; Liang, Xinyue; Jin, Minghui; Wu, Chao; Chakrabarty, Swapan; Yang, Xianming; Jiang, Yuying; Liu, Jie; Liu, Xiaolin; Quan, Weipeng; Wang, Guirong; Fan, Wei; Qian, Wanqiang; Wu, Kongming; Xiao, Yutao.

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Saldanha G; Khanna A; O'Riordan M; Bamford M.

American Journal of Surgical Pathology. 2020 Jun 26.

[Journal Article]

UI: 32604169

Authors Full Name
Saldanha, Gerald; Khanna, Aarushi; O'Riordan, Marie; Bamford, Mark.

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Huang F.

Insect Science. 2020 Jun 01.

[Journal Article]

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Huang, Fangneng.

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4. **Gene Flow Between Bt and Non-Bt Plants in a Seed Mixture Increases Dominance of Resistance to Pyramided Bt Corn in Helicoverpa zea (Lepidoptera: Noctuidae).**

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Carriere Y; Degain BA; Harpold VS; Unnithan GC; Tabashnik BE.

Journal of Economic Entomology. 2020 Jun 25.

[Journal Article]

UI: 32582955

Authors Full Name
Carriere, Yves; Degain, Ben A; Harpold, Virginia S; Unnithan, Gopalan C; Tabashnik, Bruce E.

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5. **Dynamics of canopy-dwelling arthropods under different weed management options, including glyphosate, in conventional and genetically modified insect-resistant maize.**

Garcia-Ruiz E; Cobos G; Sanchez-Ramos I; Pascual S; Chueca MC; Escorial MC; Santin-Montanya I; Loureiro I; Gonzalez-Nunez M.

Insect Science. 2020 May 27.

[Journal Article]

UI: 32458593

Authors Full Name
Garcia-Ruiz, Esteban; Cobos, Guillermo; Sanchez-Ramos, Ismael; Pascual, Susana; Chueca, Maria-Cristina; Escorial, Maria-Concepcion; Santin-Montanya, Ines; Loureiro, Inigo; Gonzalez-Nunez, Manuel.

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