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Review of Scientific Literature Relevant to the Food/Feed and Environmental Risk Assessment of Event GA21 Maize

Literature Review

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LIST OF ACRONYMS AND ABBREVIATIONS

EU	European Union
ISAAA	International Service for the Acquisition of Agri-Biotech Applications
PICO/PECO	Population, Intervention/Exposure, Comparator, Outcomes

1.0 OBJECTIVE

This systematic literature search identified literature and/or information on GA21 maize that is relevant to the risk assessment of genetically modified organisms. Maize plants (*Zea mays* L., corn) derived from transformation event GA21 contain the transgene *mepsps*, which encodes the enzyme mEPSPS. The native 5-enol pyruvylshikimate-3-phosphate synthase (EPSPS) from *Z. mays* is involved in synthesis of aromatic amino acids and is inhibited by glyphosate. The double-mutated mEPSPS produced by GA21 maize has low affinity for glyphosate compared to the native EPSPS, thus conferring tolerance to glyphosate in herbicide products. 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).

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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 GA21 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	GA21 maize derived food/feed products, mEPSPS 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 were screened first by date range June 1, 2018 to June 30, 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	GA21 maize, derived food/feed products, and/or the intended trait(s)	Intended traits include mEPSPS and closely related variants.
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 GA21 maize (information/data requirements provided in Table 3) were considered relevant. Based on the scope of the application certain information/data requirements are 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. Reviews were only included if they present data that are not available from a primary research study. Risk assessments performed and reported by relevant key organizations were included if they address GA21 maize, mEPSPS and closely related variants.
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 was 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	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.
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 GA21 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 were 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 GA21 maize. Therefore, GMOs that contain the same transgenic proteins, but are introduced into another plant species may be included. For certain types of data, the presence of mEPSPS in a different plant species will not impact the assessment of GA21 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.
Date of information	For internet pages only, the date of the information presented should be within the date range of the literature review (from June 1, 2018 through the date the search was conducted).	Documents returned from the searches of the webpages that were out of date were excluded.

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.

Information/data requirement	**Non-exhaustive list of specific information/data requirements**
Molecular characterization of the genetic modification of GA21 maize	• Information on the insert including: sequence, size, copy number, genetic element arrangement, deletions, location, sequence similarity searches, analysis of open reading frames • Expression data of inserted/modified sequences • Genetic stability • Molecular and biochemical characterization of the protein(s) such as: primary structure, molecular weight, post-translational modifications • 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
Agronomic, phenotypic and compositional characterization of the GA21 maize	• Comparative assessment of agronomic and phenotypic characteristics under field or controlled conditions • Comparative analysis of key nutritional constituents were only considered relevant if generated on GA21 maize material.
Toxicological assessment of newly expressed protein(s), new constituents other than proteins, and the whole GM food/feed	• Amino acid sequence comparison between the newly expressed protein(s) and toxic proteins • Stability of the protein(s) under relevant processing and storage conditions • Investigation of proteolytic susceptibility of the newly expressed protein • Toxicity studies • Feeding studies that used plant material must use GA21 maize as the source of plant material to be considered relevant
Allergenicity assessment of the newly expressed protein and the GM food/feed, and adjuvanticity	• Amino acid sequence comparison between the newly expressed protein and known allergens or celiac disease peptide sequences • Serum screening • Pepsin susceptibility testing • *In vivo* tests in animal models • Expression data for endogenous allergens in maize • 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 GA21 maize and the resulting nutritional impact • Comparative growth performance studies with young rapidly growing animal species. If the diet contains plant material the source of the plant material must be GA21 to be considered relevant.

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 • Replacement capacity • Fitness of the GM plant in various environmental conditions – mEPSPS or closely related variants are expressed in a different plant species then the publication may be considered relevant.
Assessment of plant to micro-organism gene transfer	• Homology searches at nucleotide level between the GM event and microorganisms. Publications would have to utilize sequence from GA21 maize specifically to be considered relevant
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 GA21 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 GA21 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 feces from animals fed the GM plant, and other by-products of industrial processes)". Therefore, any publications that discuss direct exposure in test protein 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 GA21 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 GA21 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 GA21 maize in the EU. Cultivation of GA21 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 GA21 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 GA21 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 GA21 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 GA21 maize.

TABLE 4 Key Organizations Pages Included in the Search

Regulatory agency name	URL
US Environmental Protection Agency	https://www.epa.gov/ingredients-used-pesticide-products/current-and-previously-registered-section-3-plant-incorporated
US Department of Agriculture	https://www.aphis.usda.gov/aphis/ourfocus/biotechnology
US Food and Drug Administration	https://www.accessdata.fda.gov/scripts/fdcc/?set=Biocon
Canadian Food Inspection Agency	http://www.inspection.gc.ca/plants/plants-with-novel-traits/notices-of-submission/eng/1300143491851/1300143550790
Health Canada*	https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/approved-products.html
Food Standards Australia New Zealand	http://www.foodstandards.gov.au/consumer/gmfood/applications/Pages/default.aspx
Office of the Gene Technology Regulator	http://www.ogtr.gov.au/
Intersecretarial Commission on Biosafety of GMOs	http://www.conacyt.gob.mx/cibiogem/index.php/cibiogem
National Technical Commission on Biosafety	http://ctnbio.mcti.gov.br/
National Advisory Commission on Agriculture Biotechnology**	https://www.argentina.gob.ar/agroindustria/alimentos-y-bioeconomia/ogm-comerciales
Ministry of Environment, Forest and Climate change	http://moef.gov.in/
Ministry of Agriculture, Forestry and Fisheries	http://www.maff.go.jp/e/
European Food Safety Authority	http://www.efsa.europa.eu/

*Also searches Environment and Climate Change Canada

**The traditional website search method was ineffective. Therefore, this webpage was searched using the find function <control F>.

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 (June 2018 through the date the search was conducted) 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

<u>Identifying search terms</u>

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 dated 2017 (EFSA 2017) 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, 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 OR Trade Name) or (Event OR Trade name OR ((Intended Trait OR Newly Expressed Protein) 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 Proteins, 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 GA21 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	GA21 OR GA 21 OR GA2I OR GA 2I OR MON ØØØ21* OR MON OOO21* OR MON 00021* OR MON empty setempty setempty set21* OR MONØØØ21* OR MONOOO21* OR MON00021* OR MONempty setempty setempty set21* OR M0N ØØØ21* OR M0N OOO21* OR M0N 00021* OR M0N empty setempty setempty set21* OR M0NØØØ21* OR M0NOOO21* OR M0N00021* OR M0Nempty setempty setempty set21*	Event
2	Topic	((Roundup* OR round up*) ADJ2 ready*) ADJ3 (maize OR corn OR Zea mays OR Z mays) OR RR maize* OR RR corn* OR (Agrisure* ADJ3 (GT* OR TG*)) OR AgrisureTMGT	Trade name
3	Topic	5 enol pyruvyl shikimate 3 phosphate synthase OR 5 enolpyruvyl shikimate 3 phosphate synthase OR 5 enolpyruvylshikimate 3 phosphate synthase OR EPSP synthase OR MEPSP synthase OR EPSPS OR MEPSPS OR EC 2.5.1.1.9 OR E.C. 2.5.1.1.9	Newly expressed protein
4	Topic	((gl?phosate OR gl?fosate OR roundup* OR round up* OR herbicide* OR pesticide*) ADJ2 (toleran* OR resistan* OR protect*))	Intended trait (herbicidal)
5	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
6	Topic	GMHT OR GEHT OR GMHR or GEHR OR GMHTs OR GEHTs OR GMHRs OR GEHRs	GMO general x intended trait
7	Topic	Maize* OR corn* OR Zea mays OR Z mays	Plant species
8		#3 AND (#5 OR #7)	(Newly expressed protein AND (GMO general OR plant species))
9		(#4 AND #5) OR #6	((Intended trait AND GMO general) OR GMO general x intended trait)
10		#9 AND #7	(((Intended trait AND GMO general) OR GMO general x intended trait) AND plant species)
11		#1 OR #2 OR #8 OR #10	Event OR Trade names OR (Newly expressed protein AND (GMO general OR plant species)) OR (((Intended trait AND GMO general) OR GMO general x intended trait) AND plant species)

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 June 1, 2018 and June 30, 2019 (see Table 8).

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 proteins from the ISAAA database for use in searching regulatory agency web pages

Event	Search term	Concepts/Key Elements
GA21	GA21	Event name
GA21	Modified 5-enolpyruvylshikimate-3-phosphate synthase enzyme	Newly expressed protein

3.4 Reference Publications

Previously conducted literature reviews have successfully returned literature relevant to the risk assessment of GA21 maize. The search strategy defined in this report was run and the reference publications listed below in Table 7 were returned. Therefore, the search terms selected are suitable to retrieve and/or identify the already known literature on the intervention/exposure of GA21 maize.

The reference publications utilized are identified in Table 7 (X indicates that the publication was retrieved in the database). The percentage of publications retrieved in each database is provided.

TABLE 7 Reference publications

Data/Information requirement	Reference	Medline	CAB Abstracts	BIOSIS	Agricola
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Devos, Yann, Ortiz-Garcia, Sol, Hokanson, Karen E. & Raybould, Alan. 2018. Teosinte and maize x teosinte hybrid plants in Europe-Environmental risk assessment and management implications for genetically modified maize. Agriculture Ecosystems & Environment, 259, 19-27.201		X	X	
Agronomic, phenotypic and compositional characterisation of the GM plant	Bernillon S, Maucourt M, Deborde C, Chereau S, Jacob D, Priymenko N, et al 2018. Characterization of GMO or glyphosate effects on the composition of maize grain and maize-based diet for rat feeding. Metabolomics, 14, 36. 2018	X		X	
Toxicological assessment of newly expressed protein(s), new constituents other than proteins, and the whole GM food/feed 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	Matthews BA, Launis KL, Bauman PA & Juba NC. 2017. Double-Mutated 5-Enol Pyruvylshikimate-3-phosphate Synthase Protein Expressed in MZHG0JG Corn (Zea mays L.) Has No Impact on Toxicological Safety and Nutritional Composition. Journal of Agricultural & Food Chemistry, 65, 8459-8465 2017	X	X		X
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Fang J, Nan P, Gu Z, Ge X, Feng YQ & Lu BR. (2018). Overexpressing Exogenous 5-Enolpyruvylshikimate-3-Phosphate Synthase (EPSPS) Genes Increases Fecundity and Auxin Content of Transgenic Arabidopsis Plants. Frontiers in Plant Science, 9, 233	X	X	X	
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Yang X, Li L, Jiang X, Wang W, Cai X, Su J, et al. (2017). Genetically engineered rice endogenous 5-enolpyruvoylshikimate-3-phosphate synthase (epsps) transgene alters phenology and fitness of crop-wild hybrid offspring. Scientific Reports, 7, 6834	X		X	
	Percentage of records returned	80% (4/5)	60% (3/5)	80% (4/5)	20% (1/5)

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.

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.

The reviewers met to discuss their disagreements and further refined their understanding of the criteria for relevance. The reviewers independently re-reviewed the potential relevance of those titles upon which they disagreed. Documents with vague and generic titles were moved forward for full-length document review.

A kappa test was performed after the title/abstract publication selection (stage 1) and before initiating the full-text screening process. The kappa test score was 0.434. Because the review only considers manuscripts published within a small duration (one year), the searches are expected to return a small number of relevant compared to a large number of non-relevant manuscripts. Therefore, the reviewers adopted a broad inclusion criteria to ensure that all potentially relevant publications were captured. At the completion of stage 1 there were 173 records retrieved from the databases (with duplicates removed). There were 168 agreements, including agreement regarding two manuscripts at the title/abstract phase which were subsequently moved to stage two. There were five disagreements due to conservative reviewer judgement rather than narrower reviewer judgement. These publications proceeded to the next phase of review (review of the full documents). In this case, a kappa value smaller than 0.6 should not be of concern as the reviewers applied a broad inclusion criteria to their ratings of the titles and abstracts to ensure vague and non-specific titles and abstracts were moved forward for full-length document review.

Full-length articles were reviewed in Stage 2. A reason for exclusion is provided for any records that were deemed not relevant in Stage 2. Any relevant records identified in stage 2 were subjected to reliability assessments and evaluations of the implications of those records on the food and feed or environmental risk assessments. Reviewers came to a consensus on all records.

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. When the website records were published in English, they were assessed by two independent reviewers. Due to format the full-text documents were assessed to determine relevance. When the website records were not published in English a single reviewer that speaks the language of those documents determined if they should be classified as a risk assessment, scientific opinion/report or document on the biology of the crop of interest. If a document was classified as one of these document types then it was translated to English and two independent reviewers determined if it met the other criteria for inclusion. Only if records were classified as one of the relevant document types and excluded based on other eligibility criteria was the rationale for its exclusion provided. Internet pages with URLs that lead to meaningless or no information (broken links) were also excluded.

4.2 Summarizing and Reporting the Data

This report provides detail about the search process and its results. The methodological framework in this report involves summarizing and reporting the literature, and applying meaning to the results as outlined in the Explanatory Note (EFSA 2019).

4.3 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. Additionally, the line by line strategy with the number of publications identified per line is presented. See Appendix A.

TABLE 8 Electronic bibliographic database search details

Database	Search Date	Service provider	Date span of the search	Any limits applied to the search	Total number of records retrieved after removing duplicates
Agricola	08/07/2019	Ovid Technologies	01/06/2018 to 30/06/2019	Dates	2
BIOSIS Previews	08/07/2019	Ovid Technologies	01/06/2018 to 30/06/2019	Dates	20
CAB Abstracts	08/07/2019	Ovid Technologies	01/06/2018 to 30/06/2019	Dates	74
Medline	08/07/2019	Ovid Technologies	01/06/2018 to 30/06/2019	Dates	77

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

For records from reference lists from manual searches, the following was recorded: the bibliographic details of the documents whose reference lists were scanned and the number of relevant bibliographic references retrieved.

TABLE 9 Regulatory agency webpage search details

Regulatory agency name	URL	Date of Search	Date of Most Recent Website Update	Date Span of Search	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	7/23/2019	10/24/2018	June 1, 2018 to June 30, 2019	0	0
US Department of Agriculture	https://www.aphis.usda.gov/aphis/ourfocus/biotechnology	7/23/2019	No update information provided	June 1, 2018 to June 30, 2019	59	0
US Food and Drug Administration	https://www.accessdata.fda.gov/scripts/fdcc/?set=Biocon	7/23/2019	5/9/2019	June 1, 2018 to June 30, 2019	2	0

Regulatory agency name	URL	Date of Search	Date of Most Recent Website Update	Date Span of Search	Total number of records retrieved after removing duplicates	Number of relevant records
Canadian Food Inspection Agency	http://www.inspection.gc.ca/plants/plants-with-novel-traits/notices-of-submission/eng/1300143491851/1300143550790	7/24/2019	1/17/2019	June 1, 2018 to June 30, 2019	24	2
Health Canada	https://www.canada.ca/en/health-canada/services/food-nutrition/genetically-modified-foods-other-novel-foods/approved-products.html	7/24/2019	1/24/2019	June 1, 2018 to June 30, 2019	37	2
Food Standards Australia New Zealand	http://www.foodstandards.gov.au/consumer/gmfood/applications/Pages/default.aspx	7/25/2019	No update information provided	June 1, 2018 to June 30, 2019	38	1
Office of the Gene Technology Regulator	http://www.ogtr.gov.au/	7/25/2019	7/25/2019	June 1, 2018 to June 30, 2019	3	0
Intersecretarial Commission on Biosafety of GMOs	http://www.conacyt.gob.mx/cibiogem/index.php/cibiogem	7/19/2019	No update information provided	June 1, 2018 to June 30, 2019	5	0
National Technical Commission on Biosafety	http://ctnbio.mcti.gov.br/	7/17/2019	No update information provided	June 1, 2018 to June 30, 2019	96	0
National Advisory Commission on Agriculture Biotechnology	https://www.argentina.gob.ar/agroindustria/alimentos-y-bioeconomia/ogm-comerciales	8/6/2019	No update information provided	June 1, 2018 to June 30, 2019	5	0
Ministry of Environment, Forest and Climate change	http://moef.gov.in/	7/23/2019	No update information provided	June 1, 2018 to June 30, 2019	0	0
Ministry of Agriculture, Forestry and Fisheries	http://www.maff.go.jp/e/	7/19/2019	No update information provided	June 1, 2018 to June 30, 2019	86	2
European Food Safety Authority	http://www.efsa.europa.eu/	7/25/2019	No update information provided	June 1, 2018 to June 30, 2019	16	0

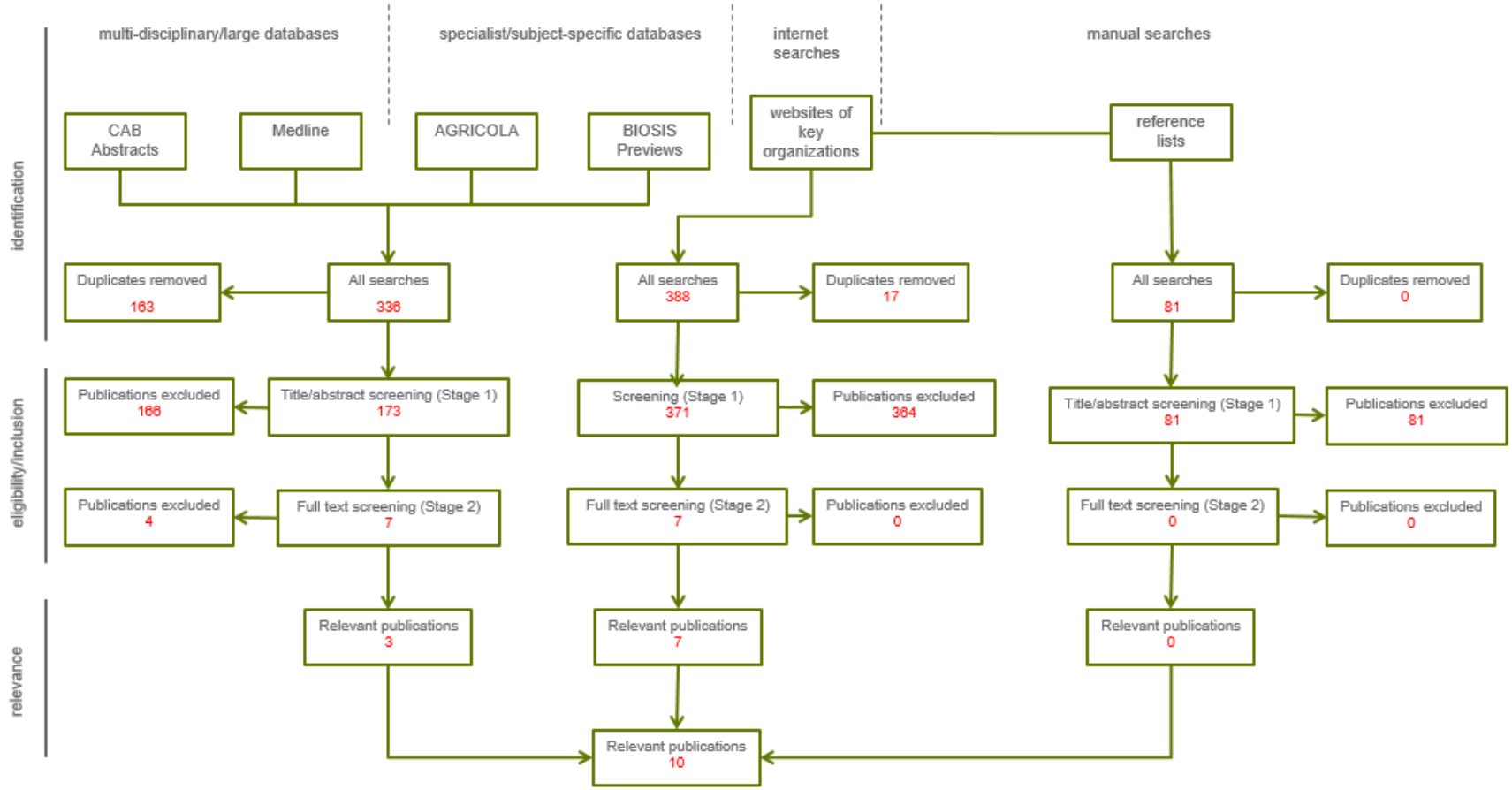
The results of the selection process are recorded in Table 10 and a flow chart of the publication selection process is shown in Figure 1.

TABLE 10 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* searches of the scientific literature (excluding duplicates)	625
Database results identified	173
Internet results identified	371
**References from relevant database results identified	81
Publications excluded from the search results after screening of title and abstracts*** (stage 1)	611
Database results excluded	166
Internet results excluded	364
References from relevant database results excluded	81
Publications screened using full-text (stage 2)	7
Database results screened	7
Internet results screened	0
References from relevant database results screened (all already excluded)	0
Publications excluded after full-text screening	4
Database results full-text excluded	4
Internet results full-text excluded	0
References from relevant database results full-text excluded (all already excluded)	0
Unobtainable publications	0
Unclear publications	0
Publications considered relevant	10
Database results relevant	3
Internet results relevant	7
References from relevant database results relevant	0

*Both from electronic bibliographic databases and other sources of scientific literature.
**There were additional record titles (81) reviewed from the references of relevant internet documents retrieved from searching regulatory agency websites. These were excluded from search results after screening of titles. There were no relevant records found among these references.
***Due to the formatting of records (e.g. lack of abstracts) from the websites of key organizations the stage 1 review was performed by a first scanning through the documents.

FIGURE 1 Flow chart of the publication selection process



4.4 Relevant Publications

A list of the full bibliographic references for all relevant publications, ordered by category of information/data requirement is recorded in Table 11. A list of the full bibliographic references for all relevant publications retrieved after assessment of internet documents is recorded in Table 12.

TABLE 11 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
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Beres ZT et al. 2018	Overexpression of a native gene encoding 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) may enhance fecundity in Arabidopsis thaliana in the absence of glyphosate	International Journal of Plant Sciences
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Devos Y *et al.* 2018	Teosinte and maize × teosinte hybrid plants in Europe – Environmental risk assessment and management implications for genetically modified maize	Agriculture, Ecosystems & Environment
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Fang J et al. 2018	Overexpressing exogenous 5-enolypyruvylshikimate-3-phosphate dynthase (EPSPS) genes increases fecundity and auxin content of transgenic Arabidopsis plants	Frontiers of Plant Science

TABLE 12 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	Ministry of Agriculture, Forestry and Fisheries (MAFF 2019)	Opinions of academics	http://www.maff.go.jp/j/press/syouan/nouan/pdf/091111-06.pdf
Risk Assessment	Ministry of Agriculture, Forestry and Fisheries (MAFF 2018)	Confirmation of safety of feed using recombinant DNA technology Herbicides glyphosate and 4-hydroxyfe Nilpyruvate dioxygenase-inhibiting weeding Agent resistant cotton GHB811	http://www.maff.go.jp/j/council/sizai/siryou/46/attach/pdf/index-21.pdf
Risk Assessment	Australia New Zealand Food Authority (FSANZ 2019)	Final Risk Analysis Report Application A362 Food derived from glyphosate-tolerant corn line GA21	http://www.foodstandards.gov.au/code/applications/Documents/A362%20draft%20IR.pdf
Risk Assessment	Health Canada (HC 2018)	Decision Document DD2016-116 Determination of the Safety of Syngenta Canada Inc.'s Corn (Zea mays L.) Event MZHG0JG	http://www.inspection.gc.ca/plants/plants-with-novel-traits/approved-under-review/decision-documents/dd2016-116/eng/1542814694637/1542814694922
Risk Assessment	Health Canada (HC 2019)	Decision Document DD2018-123 - Determination of the Safety of BASF Canada Inc. (Gossypium hirsutum) Event GHB811	http://www.inspection.gc.ca/plants/plants-with-novel-traits/approved-under-review/decision-documents/dd2018-123/eng/1557524933819/1557524934100
Risk Assessment	Canadian Food Inspection Agency (CFIA 2018)	Decision Document DD2016-116 Determination of the Safety of Syngenta Canada Inc.'s Corn (Zea mays L.) Event MZHG0JG	plants-with-novel-traits/approved-under-review/decision-documents/dd2016-116/eng/1542814694637/1542814694922
Risk Assessment	Canadian Food Inspection Agency (CFIA 2019)	Decision Document DD2018-123 - Determination of the Safety of BASF Canada Inc. (Gossypium hirsutum) Event GHB811	http://www.inspection.gc.ca/plants/plants-with-novel-traits/approved-under-review/decision-documents/dd2018-123/eng/1557524933819/1557524934100

*Canadian Food Inspection Agency and Health Canada provide the same search results and URLs are from the same database; this refers to documents DD2016-116 and DD2018-123. Therefore, of the 7 relevant internet results, 2 appear to be document duplicates. These documents were kept because they were counted in the original search results. The reviewers assessed the webpages by agency. Deduplications were done by agency.

4.5 Excluded Publications After Detailed Assessment of Full-Text Documents

A list of the full bibliographic references for all excluded studies retrieved from database searching after detailed assessment of full-text documents for relevance (i.e. stage 2), with justification for their exclusion, is recorded in Table 13.

TABLE 13 Report of publications excluded from the risk assessment after detailed assessment of full-text documents

List of bibliographic references for all studies excluded from the risk assessment, classified by authors

Study (Author(s) and year)	Title	Source	Reason(s) for exclusion based on eligibility/inclusion criteria
Bernillon S et al. 2018	Characterization of GMO or glyphosate effects on the composition of maize grain and maize-based diet for rat feeding	Metabolomics	Intervention/exposure not relevant
Costa FR et al. 2018	Lack of effects of glyphosate and glufosinate on growth, mineral content and yield of glyphosate- and glufosinate-resistant maize	GM Crops & Food	Intervention/exposure not relevant
Peng C et al. 2019	Effect on metabolome of the grains of transgenic rice containing insecticidal cry and glyphosate tolerance epsps genes	Plant Growth Regulation	Intervention/exposure not relevant
Reddy KN et al. 2018	Glyphosate resistance technology has minimal or no effect on maize mineral content and yield	Journal of Agricultural and Food Chemistry	Intervention/exposure not relevant

4.6 Unobtainable Publications

No publications were considered unobtainable.

4.7 Unclear Publications

No publications were classified as unclear.

4.8 Full-Text Documents

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

4.9 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.

4.10 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 was recorded in Table 14 and in Table 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
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Beres ZT et al. 2018	High: clearly described experimental procedures and reported results provide evidence of reproducibility and accuracy of the findings	Fitness-related traits of GA21 maize were examined in agronomic field trials. That data supports the conclusion that the agronomic characteristics analyzed in GA21 maize are considered comparable to those of conventional maize. The information provided in this publication does not change the conclusion of the risk assessment for GA21 maize.
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Devos Y et al. 2018	High: clearly described experimental procedures and reported results provide evidence of reproducibility and accuracy of the findings	"While scientific uncertainties about certain steps in the pathways remain – indeed there can never be complete certainty about the occurrence of any natural phenomenon – this does not preclude completing the risk assessment because these uncertainties can be handled by making worst-case assumptions (Raybould and Cooper, 2005)." The information in this publication does not change the conclusion of the risk assessment for GA21 maize.
Persistence and invasiveness assessment, including plant-to-plant gene transfer	Fang J et al. 2018	High: clearly described experimental procedures and reported results provide evidence of reproducibility and accuracy of the findings	Fitness-related traits were examined in Arabidopsis overexpressing EPSPS. The authors concluded that the data support the hypothesis that transgenic plants overproducing EPSPS can benefit from a fecundity advantage in glyphosate-free environments. Fitness-related traits of GA21 maize were examined in agronomic field trials. Based on the results from implementation of the EFSA statistical methodology, it was concluded that the agronomic characteristics analyzed in GA21 maize are considered to be comparable to those of conventional maize. The information provided in this publication does not change the conclusion of the risk assessment for GA21 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	Ministry of Agriculture, Forestry and Fisheries (MAFF 2019)	Not assignable because no or insufficient information is reported in the document	This document is considered a risk assessment based on a data package provided by the sponsor company, and contains their conclusions related to specific protection goals. The information provided in this document does not change the conclusion of the risk assessment for GA21 maize.
Risk assessment or scientific opinion	Ministry of Agriculture, Forestry and Fisheries, no date provided (MAFF 2018)	Not assignable because no or insufficient information is reported in the document	This document is considered a risk assessment based on a data package provided by the sponsor company, and contains their conclusions related to specific protection goals. The information provided in this document does not change the conclusion of the risk assessment for GA21 maize.
Risk assessment or scientific opinion	Food Standards Australia New Zealand no date provided (FSANZ 2019)	Not assignable because no or insufficient information is reported in the document	This document is considered a risk assessment based on a data package provided by the sponsor company, and contains their conclusions related to specific protection goals. The information provided in this document does not change the conclusion of the risk assessment for GA21 maize.
Risk assessment or scientific opinion	Health Canada (HC 2018)	Not assignable because no or insufficient information is reported in the document	This document is considered a risk assessment based on a data package provided by the sponsor company, and contains their conclusions related to specific protection goals. The information provided in this document does not change the conclusion of the risk assessment for GA21 maize.

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	Health Canada (HC 2019)	Not assignable because no or insufficient information is reported in the document	This document is considered a risk assessment based on a data package provided by the sponsor company, and contains their conclusions related to specific protection goals. The information provided in this document does not change the conclusion of the risk assessment for GA21 maize.
Risk assessment or scientific opinion	Canadian Food Inspection Agency (CFIA 2018)	Not assignable because no or insufficient information is reported in the document	This document is considered a risk assessment based on a data package provided by the sponsor company, and contains their conclusions related to specific protection goals. The information provided in this document does not change the conclusion of the risk assessment for GA21 maize.
Risk assessment or scientific opinion	Canadian Food Inspection Agency (CFIA 2019)	Not assignable because no or insufficient information is reported in the document	This document is considered a risk assessment based on a data package provided by the sponsor company, and contains their conclusions related to specific protection goals. The information provided in this document does not change the conclusion of the risk assessment for GA21 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

Beres ZT, Yang X, Jin L, Zhao W, Mackey DM, Snow AA. 2018. Overexpression of a Native Gene Encoding 5-Enolpyruvylshikimate-3-Phosphate Synthase (EPSPS) May Enhance Fecundity in Arabidopsis thaliana in the Absence of Glyphosate. International Journal of Plant Sciences 179: 390-401.

Bernillon S, Maucourt M, Deborde C, Chereau S, Jacob D, Priymenko N, Laporte B, Coumoul X, Salles B, Rogowsky PM, Richard-Forget F, Moing A. 2018. Characterization of GMO or glyphosate effects on the composition of maize grain and maize-based diet for rat feeding. Metabolomics 14: 36.

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Fang J, Nan P, Gu Z, Ge X, Feng Y-Q, Lu B-R. 2018. Overexpressing Exogenous 5-Enolpyruvylshikimate-3-Phosphate Synthase (EPSPS) Genes Increases Fecundity and Auxin Content of Transgenic Arabidopsis Plants. Frontiers in Plant Science 9: 233.

FSANZ 2019. *Final Risk Analysis Report Application A362 Food derived from glyphosate-tolerant corn line GA21*. Canberra, Australia: Food Standards Australia New Zealand. http://www.foodstandards.gov.au/code/applications/Documents/A362%20draft%20IR.pdf (Accessed July 25, 2019)

HC 2018. *Decision Document DD2016-116 Determination of the Safety of Syngenta Canada Inc.'s Corn (Zea mays L.) Event MZHG0JG*. Ottawa, Canada http://www.inspection.gc.ca/plants/plants-with-novel-traits/approved-under-review/decision-documents/dd2016-116/eng/1542814694637/1542814694922 (November 30, 2018)

HC 2019. *Decision Document DD2018-123 - Determination of the Safety of BASF Canada Inc. (Gossypium hirsutum) Event GHB811*. Ottawa, Canada http://www.inspection.gc.ca/plants/plants-with-novel-traits/approved-under-review/decision-documents/dd2018-123/eng/1557524933819/1557524934100 (June 3, 2019)

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Peng C, Ding L, Hu C, Chen X, Wang X, Xu X, Li Y, Xu J. 2019. Effect on metabolome of the grains of transgenic rice containing insecticidal cry and glyphosate tolerance epsps genes. Plant Growth Regulation 88: 1-7.

Raybould, A, and Cooper, I. 2005. Tiered tests to assess the environmental risk of fitness changes in hybrids between transgenic crops and wild relatives: the example of virus resistant Brassica napus. Environmental Biosafety Research 4(3): 127-140.

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APPENDICES SECTION

APPENDIX A Search history and subject indexing

Terms were searched individually line by line, however when the proximity operator adj2 is used the Ovid platform displays the terms on one line as a group such as (term,term2,term3)adj2 (term4,term5,term6)

Search My Workspace

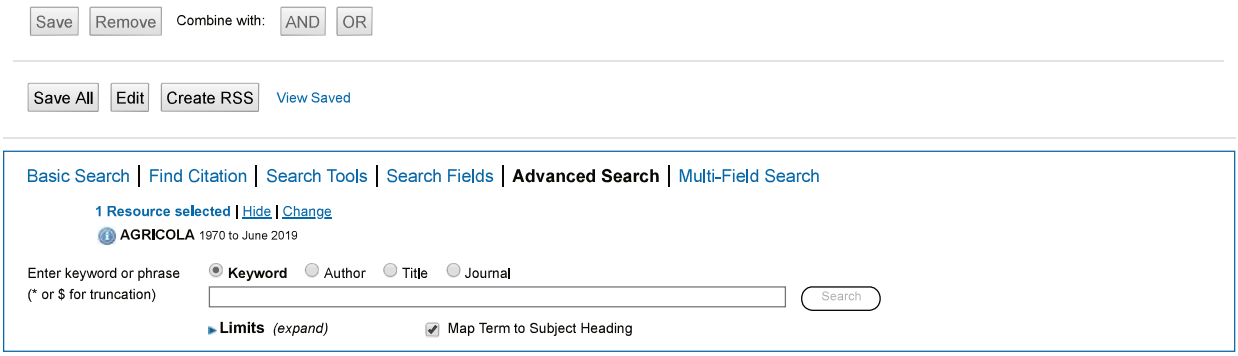
▼ Search History (101)

# ▲	Searches	Results	Type	Actions	Annotations
1	GA21.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	49	Advanced	Display Results | More	
2	GA 21.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	3	Advanced	Display Results | More	
3	GA2I.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1	Advanced	Display Results | More	
4	GA 2I.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
5	"MON ØØØ21*".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	2	Advanced	Display Results | More	
6	MON OOO21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
7	MON 00021*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
8	MON empty setempty setempty set21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
9	"MONØØØ21*".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1	Advanced	Display Results | More	
10	MONOOO21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
11	MON00021*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
12	MONempty setempty setempty set21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
13	"M0N ØØØ21*".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
14	M0N OOO21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
15	M0N 00021*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
16	M0N empty setempty setempty set21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
17	"M0NØØØ21*".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
18	M0NOOO21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
19	M0N00021*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
20	M0Nempty setempty setempty set21*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
21	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20	56	Advanced	Display Results | More	
22	Roundup*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1220	Advanced	Display Results | More	
23	round up*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	127	Advanced	Display Results | More	
24	22 or 23	1336	Advanced	Display Results | More	
25	((Roundup* or round up*) adj2 ready*).mp.	536	Advanced	Display Results | More	
26	maize.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	61066	Advanced	Display Results | More	
27	corn.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	97820	Advanced	Display Results | More	
28	Zea mays.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	44698	Advanced	Display Results | More	
29	Z mays.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	311	Advanced	Display Results | More	
30	26 or 27 or 28 or 29	137370	Advanced	Display Results | More	

Contract

31	((Roundup* or round up*) adj2 ready* adj3 (maize or corn or Zea mays or Z mays)).mp.	36	Advanced	Display Results | More	
32	RR maize*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	2	Advanced	Display Results | More	
33	RR corn*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	5	Advanced	Display Results | More	
34	Agrisure*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	15	Advanced	Display Results | More	
35	GT*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	14344	Advanced	Display Results | More	
36	TG*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	34141	Advanced	Display Results | More	
37	35 or 36	48060	Advanced	Display Results | More	
38	(Agrisure* adj3 (GT* or TG*)).mp.	3	Advanced	Display Results | More	
39	AgrisureTMGT.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
40	31 or 32 or 33 or 38 or 39	43	Advanced	Display Results | More	
41	5 enol pyruvyl shikimate 3 phosphate synthase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	13	Advanced	Display Results | More	
42	5 enolpyruvyl shikimate 3 phosphate synthase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	22	Advanced	Display Results | More	
43	5 enolpyruvylshikimate 3 phosphate synthase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	237	Advanced	Display Results | More	
44	EPSP synthase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	61	Advanced	Display Results | More	
45	MEPSP synthase.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
46	EPSPS.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	400	Advanced	Display Results | More	
47	MEPSPS.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	6	Advanced	Display Results | More	
48	"EC 2.5.1.1.9".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	17	Advanced	Display Results | More	
49	"E.C. 2.5.1.1.9".mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	17	Advanced	Display Results | More	
50	41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49	557	Advanced	Display Results | More	
51	gl?phosate.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	6826	Advanced	Display Results | More	
52	gl?fosate.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	7	Advanced	Display Results | More	
53	roundup*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1220	Advanced	Display Results | More	
54	round up*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	127	Advanced	Display Results | More	
55	herbicide*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	53300	Advanced	Display Results | More	
56	pesticide*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	118882	Advanced	Display Results | More	
57	51 or 52 or 53 or 54 or 55 or 56	153808	Advanced	Display Results | More	
58	toleran*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	97943	Advanced	Display Results | More	
59	resistan*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	251371	Advanced	Display Results | More	
60	protect*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	241546	Advanced	Display Results | More	
61	58 or 59 or 60	547274	Advanced	Display Results | More	
62	((gl?phosate or gl?fosate or roundup* or round up* or herbicide* or pesticide*) adj2 (toleran* or resistan* or protect*)).mp.	7957	Advanced	Display Results | More	
63	GMO*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1258	Advanced	Display Results | More	
64	LMO*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	460	Advanced	Display Results | More	
65	GM.mp. [mp=meeting information, title, original title, map information, note, abstract,	6685	Advanced	Display Results | More	

		heading words]				
☐	66	GE.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	4186	Advanced	Display Results | More	
☐	67	transgen*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	47984	Advanced	Display Results | More	
☐	68	genetic*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	593506	Advanced	Display Results | More	
☐	69	living.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	47966	Advanced	Display Results | More	
☐	70	biotech*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	34087	Advanced	Display Results | More	
☐	71	68 or 69 or 70	662300	Advanced	Display Results | More	
☐	72	modif*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	202251	Advanced	Display Results | More	
☐	73	transform*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	141448	Advanced	Display Results | More	
☐	74	manipulat*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	33427	Advanced	Display Results | More	
☐	75	improv*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	424970	Advanced	Display Results | More	
☐	76	engineer*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	128290	Advanced	Display Results | More	
☐	77	deriv*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	246682	Advanced	Display Results | More	
☐	78	72 or 73 or 74 or 75 or 76 or 77	1018750	Advanced	Display Results | More	
☐	79	((genetic* or living or biotech*) adj3 (modif* or transform* or manipulat* or improv* or engineer* or deriv*)).mp.	54059	Advanced	Display Results | More	
☐	80	63 or 64 or 65 or 66 or 67 or 79	94562	Advanced	Display Results | More	
☐	81	GMHT.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	26	Advanced	Display Results | More	
☐	82	GEHT.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	80	Advanced	Display Results | More	
☐	83	GMHR.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	2	Advanced	Display Results | More	
☐	84	GEHR.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	2	Advanced	Display Results | More	
☐	85	GMHTs.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
☐	86	GEHTs.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	5	Advanced	Display Results | More	
☐	87	GMHRs.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	0	Advanced	Save | More	
☐	88	GEHRs.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	1	Advanced	Display Results | More	
☐	89	81 or 82 or 83 or 84 or 85 or 86 or 87 or 88	116	Advanced	Display Results | More	
☐	90	Maize*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	61237	Advanced	Display Results | More	
☐	91	corn*.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	117864	Advanced	Display Results | More	
☐	92	Zea mays.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	44698	Advanced	Display Results | More	
☐	93	Z mays.mp. [mp=meeting information, title, original title, map information, note, abstract, heading words]	311	Advanced	Display Results | More	
☐	94	90 or 91 or 92 or 93	157396	Advanced	Display Results | More	
☐	95	80 or 94	245900	Advanced	Display Results | More	
☐	96	50 and 95	275	Advanced	Display Results | More	
☐	97	62 and 80	2095	Advanced	Display Results | More	
☐	98	89 or 97	2185	Advanced	Display Results | More	
☐	99	94 and 98	405	Advanced	Display Results | More	
☐	100	21 or 40 or 96 or 99	714	Advanced	Display Results | More	
☐	101	limit 100 to yr="2018 -Current"	43	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 2019
Enter keyword or phrase
(* or $ for truncation)
Keyword
Author
Title
Journal
Search
Limits (expand)
Map Term to Subject Heading

Terms were searched individually line by line, however when the proximity operator adj2 is used the Ovid platform displays the terms on one line as a group such as (term,term2,term3)adj2 (term4,term5,term6).

Search My Workspace

▼ Search History (101) View Saved

# ▲	Searches	Results	Type	Actions	Annotations
1	GA21.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	100	Advanced	Display Results | More	
2	GA 21.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	11	Advanced	Display Results | More	
3	GA2I.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1	Advanced	Display Results | More	
4	GA 2I.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
5	"MON ØØØ21*".mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	6	Advanced	Display Results | More	
6	MON OOO21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
7	MON 00021*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
8	MON empty setempty setempty set21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
9	"MONØØØ21*".mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1	Advanced	Display Results | More	
10	MONOOO21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
11	MON00021*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
12	MONempty setempty setempty set21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
13	"M0N ØØØ21*".mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
14	M0N OOO21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
15	M0N 00021*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
16	M0N empty setempty setempty set21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
17	"M0NØØØ21*".mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
18	M0NOOO21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
19	M0N00021*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
20	M0Nempty setempty setempty set21*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
21	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20	119	Advanced	Display Results | More	
22	Roundup*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1656	Advanced	Display Results | More	
23	round up*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	439	Advanced	Display Results | More	
24	22 or 23	2085	Advanced	Display Results | More	
25	((Roundup* or round up*) adj2 ready*).mp.	545	Advanced	Display Results | More	
26	maize.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	104197	Advanced	Display Results | More	
27	corn.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	106653	Advanced	Display Results | More	
28	Zea mays.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	57046	Advanced	Display Results | More	
29	Z mays.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1945	Advanced	Display Results | More	
30	26 or 27 or 28 or 29	213005	Advanced	Display Results | More	

Contract

31	((Roundup* or round up*) adj2 ready* adj3 (maize or corn or Zea mays or Z mays)).mp.	57	Advanced	Display Results | More	
32	RR maize*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	2	Advanced	Display Results | More	
33	RR corn*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	8	Advanced	Display Results | More	
34	Agrisure*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	24	Advanced	Display Results | More	
35	GT*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	268714	Advanced	Display Results | More	
36	TG*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	210332	Advanced	Display Results | More	
37	35 or 36	475250	Advanced	Display Results | More	
38	(Agrisure* adj3 (GT* or TG*)).mp.	7	Advanced	Display Results | More	
39	AgrisureTMGT.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
40	31 or 32 or 33 or 38 or 39	71	Advanced	Display Results | More	
41	5 enol pyruvyl shikimate 3 phosphate synthase.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	21	Advanced	Display Results | More	
42	5 enolpyruvyl shikimate 3 phosphate synthase.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	76	Advanced	Display Results | More	
43	5 enolpyruvylshikimate 3 phosphate synthase.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	606	Advanced	Display Results | More	
44	EPSP synthase.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	263	Advanced	Display Results | More	
45	MEPSP synthase.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
46	EPSPS.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	4665	Advanced	Display Results | More	
47	MEPSPS.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	67	Advanced	Display Results | More	
48	"EC 2.5.1.1.9".mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	328	Advanced	Display Results | More	
49	"E.C. 2.5.1.1.9".mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	328	Advanced	Display Results | More	
50	41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49	5190	Advanced	Display Results | More	
51	gl?phosate.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	10305	Advanced	Display Results | More	
52	gl?fosate.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	9	Advanced	Display Results | More	
53	roundup*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1656	Advanced	Display Results | More	
54	round up*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	439	Advanced	Display Results | More	
55	herbicide*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	460122	Advanced	Display Results | More	
56	pesticide*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	486217	Advanced	Display Results | More	
57	51 or 52 or 53 or 54 or 55 or 56	495969	Advanced	Display Results | More	
58	toleran*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	337681	Advanced	Display Results | More	
59	resistan*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1146211	Advanced	Display Results | More	
60	protect*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1114081	Advanced	Display Results | More	
61	58 or 59 or 60	2456456	Advanced	Display Results | More	
62	((gl?phosate or gl?fosate or roundup* or round up* or herbicide* or pesticide*) adj2 (toleran* or resistan* or protect*)).mp.	10864	Advanced	Display Results | More	
63	GMO*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	2634	Advanced	Display Results | More	
64	LMO*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	3006	Advanced	Display Results | More	
65	GM.mp. [mp=abstract, original language book title (non-english), book title (english),	62071	Advanced	Display Results | More	

		title, heading words]				
☐	66	GE.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	13511	Advanced	Display Results | More	
☐	67	transgen*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	257366	Advanced	Display Results | More	
☐	68	genetic*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	5976580	Advanced	Display Results | More	
☐	69	living.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	256120	Advanced	Display Results | More	
☐	70	biotech*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	146691	Advanced	Display Results | More	
☐	71	68 or 69 or 70	6277558	Advanced	Display Results | More	
☐	72	modif*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	959412	Advanced	Display Results | More	
☐	73	transform*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	572942	Advanced	Display Results | More	
☐	74	manipulat*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	179942	Advanced	Display Results | More	
☐	75	improv*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1688057	Advanced	Display Results | More	
☐	76	engineer*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	523873	Advanced	Display Results | More	
☐	77	deriv*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1426344	Advanced	Display Results | More	
☐	78	72 or 73 or 74 or 75 or 76 or 77	4709699	Advanced	Display Results | More	
☐	79	((genetic* or living or biotech*) adj3 (modif* or transform* or manipulat* or improv* or engineer* or deriv*)).mp.	152317	Advanced	Display Results | More	
☐	80	63 or 64 or 65 or 66 or 67 or 79	461555	Advanced	Display Results | More	
☐	81	GMHT.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	58	Advanced	Display Results | More	
☐	82	GEHT.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	30	Advanced	Display Results | More	
☐	83	GMHR.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	5	Advanced	Display Results | More	
☐	84	GEHR.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	14	Advanced	Display Results | More	
☐	85	GMHTs.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
☐	86	GEHTs.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1	Advanced	Display Results | More	
☐	87	GMHRs.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	0	Advanced	Save | More	
☐	88	GEHRs.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	4	Advanced	Display Results | More	
☐	89	81 or 82 or 83 or 84 or 85 or 86 or 87 or 88	112	Advanced	Display Results | More	
☐	90	Maize*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	104317	Advanced	Display Results | More	
☐	91	corn*.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	252938	Advanced	Display Results | More	
☐	92	Zea mays.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	57046	Advanced	Display Results | More	
☐	93	Z mays.mp. [mp=abstract, original language book title (non-english), book title (english), title, heading words]	1945	Advanced	Display Results | More	
☐	94	90 or 91 or 92 or 93	359018	Advanced	Display Results | More	
☐	95	80 or 94	807463	Advanced	Display Results | More	
☐	96	50 and 95	606	Advanced	Display Results | More	
☐	97	62 and 80	2861	Advanced	Display Results | More	
☐	98	89 or 97	2913	Advanced	Display Results | More	
☐	99	94 and 98	603	Advanced	Display Results | More	
☐	100	21 or 40 or 96 or 99	1306	Advanced	Display Results | More	
☐	101	limit 100 to yr="2018 -Current"	106	Advanced	Display Results | More	

Save | Remove | Combine with: AND | OR

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1 Resource selected | Hide | Change

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Enter keyword or phrase (* or $ for truncation)

(•) **Keyword** ( ) Author ( ) Title ( ) Journal

[ ] Search

▸ **Limits** *(expand)*

[ ] Map Term to Subject Heading

Ovid® Terms were searched individually line by line, however when the proximity operator adj2 is used the Ovid platform displays the terms on one line as a group such as (term,term2,term3)adj2 (term4,term5,term6).

Wolters Kluwer

Search My Workspace

▼ **Search History** (101) View Saved

	# ▲	Searches	Results	Type	Actions	Annotations
	1	GA21.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	100	Advanced	Display Results | More	
	2	GA 21.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	11	Advanced	Display Results | More	
	3	GA2I.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	1	Advanced	Display Results | More	
	4	GA 2I.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	5	"MON ØØØ21*".mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	25	Advanced	Display Results | More	
	6	MON OOO21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	7	MON 00021*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	8	MON empty setempty setempty set21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	9	"MONØØØ21*".mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	2	Advanced	Display Results | More	
	10	MONOOO21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	11	MON00021*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	12	MONempty setempty setempty set21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	13	"M0N ØØØ21*".mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	14	M0N OOO21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	15	M0N 00021*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	16	M0N empty setempty setempty set21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	17	"M0NØØØ21*".mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	18	M0NOOO21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	19	M0N00021*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	20	M0Nempty setempty setempty set21*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
	21	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20	137	Advanced	Display Results | More	
	22	Roundup*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	2865	Advanced	Display Results | More	
	23	round up*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	267	Advanced	Display Results | More	
	24	22 or 23	3124	Advanced	Display Results | More	
	25	((Roundup* or round up*) adj2 ready*).mp.	778	Advanced	Display Results | More	
	26	maize.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	324433	Advanced	Display Results | More	
	27	corn.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	355922	Advanced	Display Results | More	
	28	Zea mays.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	270856	Advanced	Display Results | More	
	29	Z mays.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	1144	Advanced	Display Results | More	

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☐	30	26 or 27 or 28 or 29	398848	Advanced	Display Results | More	🗨
☐	31	((Roundup* or round up*) adj2 ready* adj3 (maize or corn or Zea mays or Z mays)).mp.	59	Advanced	Display Results | More	🗨
☐	32	RR maize*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	18	Advanced	Display Results | More	🗨
☐	33	RR corn*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	7	Advanced	Display Results | More	🗨
☐	34	Agrisure*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	23	Advanced	Display Results | More	🗨
☐	35	GT*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	21735	Advanced	Display Results | More	🗨
☐	36	TG*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	43612	Advanced	Display Results | More	🗨
☐	37	35 or 36	64835	Advanced	Display Results | More	🗨
☐	38	(Agrisure* adj3 (GT* or TG*)).mp.	5	Advanced	Display Results | More	🗨
☐	39	AgrisureTMGT.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	🗨
☐	40	31 or 32 or 33 or 38 or 39	81	Advanced	Display Results | More	🗨
☐	41	5 enol pyruvyl shikimate 3 phosphate synthase.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	16	Advanced	Display Results | More	🗨
☐	42	5 enolpyruvyl shikimate 3 phosphate synthase.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	41	Advanced	Display Results | More	🗨
☐	43	5 enolpyruvylshikimate 3 phosphate synthase.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	319	Advanced	Display Results | More	🗨
☐	44	EPSP synthase.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	100	Advanced	Display Results | More	🗨
☐	45	MEPSP synthase.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	🗨
☐	46	EPSPS.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	720	Advanced	Display Results | More	🗨
☐	47	MEPSPS.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	26	Advanced	Display Results | More	🗨
☐	48	"EC 2.5.1.1.9".mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	20	Advanced	Display Results | More	🗨
☐	49	"E.C. 2.5.1.1.9".mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	20	Advanced	Display Results | More	🗨
☐	50	41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49	938	Advanced	Display Results | More	🗨
☐	51	gl?phosate.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	17687	Advanced	Display Results | More	🗨
☐	52	gl?fosate.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	35	Advanced	Display Results | More	🗨
☐	53	roundup*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	2865	Advanced	Display Results | More	🗨
☐	54	round up*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	267	Advanced	Display Results | More	🗨
☐	55	herbicide*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	182777	Advanced	Display Results | More	🗨
☐	56	pesticide*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	1047733	Advanced	Display Results | More	🗨
☐	57	51 or 52 or 53 or 54 or 55 or 56	1083228	Advanced	Display Results | More	🗨
☐	58	toleran*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	237434	Advanced	Display Results | More	🗨
☐	59	resistan*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	743133	Advanced	Display Results | More	🗨
☐	60	protect*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	540573	Advanced	Display Results | More	🗨
☐	61	58 or 59 or 60	1369203	Advanced	Display Results | More	🗨
☐	62	((gl?phosate or gl?fosate or roundup* or round up* or herbicide* or pesticide*) adj2 (toleran* or resistan* or protect*)).mp.	24676	Advanced	Display Results | More	🗨
☐	63	GMO*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	65594	Advanced	Display Results | More	🗨
☐	64	LMO*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers,	441	Advanced	Display Results | More	🗨

		cabicodes]				
☐	65	GM.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	42125	Advanced	Display Results | More	
☐	66	GE.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	6491	Advanced	Display Results | More	
☐	67	transgen*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	90036	Advanced	Display Results | More	
☐	68	genetic*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	975667	Advanced	Display Results | More	
☐	69	living.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	161502	Advanced	Display Results | More	
☐	70	biotech*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	226717	Advanced	Display Results | More	
☐	71	68 or 69 or 70	1239040	Advanced	Display Results | More	
☐	72	modif*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	381776	Advanced	Display Results | More	
☐	73	transform*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	211944	Advanced	Display Results | More	
☐	74	manipulat*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	95378	Advanced	Display Results | More	
☐	75	improv*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	992585	Advanced	Display Results | More	
☐	76	engineer*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	180782	Advanced	Display Results | More	
☐	77	deriv*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	441257	Advanced	Display Results | More	
☐	78	72 or 73 or 74 or 75 or 76 or 77	1938449	Advanced	Display Results | More	
☐	79	((genetic* or living or biotech*) adj3 (modif* or transform* or manipulat* or improv* or engineer* or deriv*)).mp.	138518	Advanced	Display Results | More	
☐	80	63 or 64 or 65 or 66 or 67 or 79	195537	Advanced	Display Results | More	
☐	81	GMHT.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	93	Advanced	Display Results | More	
☐	82	GEHT.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	122	Advanced	Display Results | More	
☐	83	GMHR.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	5	Advanced	Display Results | More	
☐	84	GEHR.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	6	Advanced	Display Results | More	
☐	85	GMHTs.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
☐	86	GEHTs.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	7	Advanced	Display Results | More	
☐	87	GMHRs.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	0	Advanced	Save | More	
☐	88	GEHRs.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	1	Advanced	Display Results | More	
☐	89	81 or 82 or 83 or 84 or 85 or 86 or 87 or 88	234	Advanced	Display Results | More	
☐	90	Maize*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	325233	Advanced	Display Results | More	
☐	91	corn*.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	408902	Advanced	Display Results | More	
☐	92	Zea mays.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	270856	Advanced	Display Results | More	
☐	93	Z mays.mp. [mp=abstract, title, original title, broad terms, heading words, identifiers, cabicodes]	1144	Advanced	Display Results | More	
☐	94	90 or 91 or 92 or 93	451752	Advanced	Display Results | More	
☐	95	80 or 94	634060	Advanced	Display Results | More	
☐	96	50 and 95	553	Advanced	Display Results | More	
☐	97	62 and 80	4820	Advanced	Display Results | More	
☐	98	89 or 97	4956	Advanced	Display Results | More	
☐	99	94 and 98	1076	Advanced	Display Results | More	

100	21 or 40 or 96 or 99	1708	Advanced	Display Results | More	
101	limit 100 to yr="2018 -Current"	110	Advanced	Display Results | More	

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Terms were searched individually line by line, however when the proximity operator adj2 is used the Ovid platform displays the terms on one line as a group such as (term,term2,term3)adj2 (term4,term5,term6).

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# ▲	Searches	Results	Type	Actions	Annotations
1	GA21.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]	50	Advanced	Display Results | More	
2	GA 21.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]	20	Advanced	Display Results | More	
3	GA2l.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	
4	GA 2l.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	
5	"MON ØØØ21*".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]	4	Advanced	Display Results | More	
6	MON OOO21*.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	
7	MON 00021*.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	
8	MON empty setempty setempty set21*.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	
9	"MONØØØ21*".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]	1	Advanced	Display Results | More	
10	MONOOO21*.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	
11	MON00021*.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	
12	MONempty setempty setempty set21*.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	
13	"M0N ØØØ21*".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	
14	M0N OOO21*.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	
15	M0N 00021*.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	
16	M0N empty setempty setempty set21*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading	0	Advanced	Save | More	

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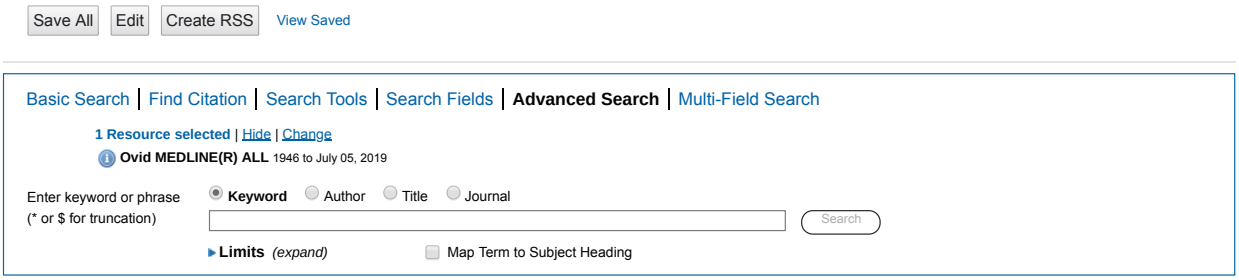
		word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]				
☐	17	"M0NØØØ21*".mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	0	Advanced	Save | More	
☐	18	M0NOOO21*.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	
☐	19	M0N00021*.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	
☐	20	M0Nempty setempty setempty set21*.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	
☐	21	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20	75	Advanced	Display Results | More	
☐	22	Roundup*.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]	1080	Advanced	Display Results | More	
☐	23	round up*.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]	556	Advanced	Display Results | More	
☐	24	22 or 23	1634	Advanced	Display Results | More	
☐	25	((Roundup* or round up*) adj2 ready*).mp.	201	Advanced	Display Results | More	
☐	26	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]	28770	Advanced	Display Results | More	
☐	27	corn.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]	33014	Advanced	Display Results | More	
☐	28	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]	33946	Advanced	Display Results | More	
☐	29	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]	320	Advanced	Display Results | More	
☐	30	26 or 27 or 28 or 29	65431	Advanced	Display Results | More	
☐	31	((Roundup* or round up*) adj2 ready* adj3 (maize or corn or Zea mays or Z mays)).mp.	26	Advanced	Display Results | More	
☐	32	RR 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]	3	Advanced	Display Results | More	
☐	33	RR corn*.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]	4	Advanced	Display Results | More	
☐	34	Agrisure*.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]	8	Advanced	Display Results | More	
☐	35	GT*.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]	151158	Advanced	Display Results | More	
☐	36	TG*.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]	171073	Advanced	Display Results | More	
☐	37	35 or 36	318267	Advanced		

					Display Results | More	
☐	38	(Agrisure* adj3 (GT* or TG*)).mp.	0	Advanced	Save | More	🗨
☐	39	AgrisureTMGT.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	🗨
☐	40	31 or 32 or 33 or 38 or 39	29	Advanced	Display Results | More	🗨
☐	41	5 enol pyruvyl shikimate 3 phosphate synthase.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]	6	Advanced	Display Results | More	🗨
☐	42	5 enolpyruvyl shikimate 3 phosphate synthase.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]	28	Advanced	Display Results | More	🗨
☐	43	5 enolpyruvylshikimate 3 phosphate synthase.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]	303	Advanced	Display Results | More	🗨
☐	44	EPSP synthase.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]	143	Advanced	Display Results | More	🗨
☐	45	MEPSP synthase.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	🗨
☐	46	EPSPS.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]	4107	Advanced	Display Results | More	🗨
☐	47	MEPSPS.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]	52	Advanced	Display Results | More	🗨
☐	48	"EC 2.5.1.1.9".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]	28	Advanced	Display Results | More	🗨
☐	49	"E.C. 2.5.1.1.9".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]	28	Advanced	Display Results | More	🗨
☐	50	41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49	4361	Advanced	Display Results | More	🗨
☐	51	gl?phosate.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]	3156	Advanced	Display Results | More	🗨
☐	52	gl?fosate.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	🗨
☐	53	roundup*.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]	1080	Advanced	Display Results | More	🗨
☐	54	round up*.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]	556	Advanced	Display Results | More	🗨
☐	55	herbicide*.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]	24167	Advanced	Display Results | More	🗨
☐	56	pesticide*.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]	54892	Advanced	Display Results | More	🗨
☐	57	51 or 52 or 53 or 54 or 55 or 56	75327	Advanced	Display Results | More	🗨

☐	58	toleran*.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]	313915	Advanced	Display Results | More	
☐	59	resistan*.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]	1049553	Advanced	Display Results | More	
☐	60	protect*.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]	794291	Advanced	Display Results | More	
☐	61	58 or 59 or 60	2041510	Advanced	Display Results | More	
☐	62	((gl?phosate or gl?fosate or roundup* or round up* or herbicide* or pesticide*) adj2 (toleran* or resistan* or protect*)).mp.	2974	Advanced	Display Results | More	
☐	63	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]	1763	Advanced	Display Results | More	
☐	64	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]	2230	Advanced	Display Results | More	
☐	65	GM.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]	49438	Advanced	Display Results | More	
☐	66	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]	17679	Advanced	Display Results | More	
☐	67	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]	203654	Advanced	Display Results | More	
☐	68	genetic*.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]	3760648	Advanced	Display Results | More	
☐	69	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]	364326	Advanced	Display Results | More	
☐	70	biotech*.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]	62356	Advanced	Display Results | More	
☐	71	68 or 69 or 70	4125936	Advanced	Display Results | More	
☐	72	modif*.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]	1048262	Advanced	Display Results | More	
☐	73	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]	574416	Advanced	Display Results | More	
☐	74	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]	183525	Advanced	Display Results | More	
☐	75	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]	2287954	Advanced	Display Results | More	
☐	76	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]	236460	Advanced	Display Results | More	
☐	77	deriv*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary	1849623	Advanced	Display Results | More	

		concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]				
☐	78	72 or 73 or 74 or 75 or 76 or 77	5455290	Advanced	Display Results | More	
☐	79	((genetic* or living or biotech*) adj3 (modif* or transform* or manipulat* or improv* or engineer* or deriv*)).mp.	146031	Advanced	Display Results | More	
☐	80	63 or 64 or 65 or 66 or 67 or 79	376916	Advanced	Display Results | More	
☐	81	GMHT.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]	31	Advanced	Display Results | More	
☐	82	GEHT.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]	505	Advanced	Display Results | More	
☐	83	GMHR.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]	6	Advanced	Display Results | More	
☐	84	GEHR.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]	20	Advanced	Display Results | More	
☐	85	GMHTs.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	
☐	86	GEHTs.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]	35	Advanced	Display Results | More	
☐	87	GMHRs.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	
☐	88	GEHRs.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]	1	Advanced	Display Results | More	
☐	89	81 or 82 or 83 or 84 or 85 or 86 or 87 or 88	597	Advanced	Display Results | More	
☐	90	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]	28840	Advanced	Display Results | More	
☐	91	corn*.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]	198928	Advanced	Display Results | More	
☐	92	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]	33946	Advanced	Display Results | More	
☐	93	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]	320	Advanced	Display Results | More	
☐	94	90 or 91 or 92 or 93	230909	Advanced	Display Results | More	
☐	95	80 or 94	601056	Advanced	Display Results | More	
☐	96	50 and 95	326	Advanced	Display Results | More	
☐	97	62 and 80	1216	Advanced	Display Results | More	
☐	98	89 or 97	1781	Advanced	Display Results | More	
☐	99	94 and 98	296	Advanced	Display Results | More	
☐	100	21 or 40 or 96 or 99	666	Advanced	Display Results | More	
☐	101	limit 100 to yr="2018 -Current"	77	Advanced	Display Results | More	

Save Remove Combine with: AND OR


Save All
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Basic Search | Find Citation | Search Tools | Search Fields | Advanced Search | Multi-Field Search
1 Resource selected | Hide | Change
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