

**Review of literature of DAS-44406-6 soybean in the scope of the
authorisations for food and feed uses, import and processing
(2021 update)**



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1. Summary

An updated systematic search and review of peer-reviewed literature was conducted for DAS-44406-6 soybean. This exercise was performed in line with the EFSA Guidance on conducting a systematic review (EFSA, 2010) and taking into account the explanatory note on literature searching (EFSA, 2019), with the following review question “Does DAS-44406-6 soybean and derived food/feed products, or the intended traits (the newly expressed protein(s)), have adverse effects on human and animal health and the environment in the scope of the authorisation?”.

The current systematic search complements the search previously performed in 2020. Unless outlined below, all portions of the search were conducted according to the methodologies outlined in the previous search.

The outcome of this analysis showed that no publication relevant for the review question was identified during the selected time period. No safety concerns were identified for DAS-44406-6 soybean by this literature search exercise.

2. Confirmation of the Suitability of the Search Strings

All portions of the search were conducted according to the methodologies outlined in the previous searches. It was confirmed that the search strategy utilized in the previous literature search report (2020) is still relevant and no updates were identified.

3. Results of the literature search exercise

3.1. Outcome of literature searches

In July 2021, searches against electronic bibliographic databases and manual searches in view of screening of reference lists were performed. The search process is reported in line with EFSA guidance (EFSA, 2010 Appendix B4(2)) in Table 2.

Table 1. Documenting and reporting the search process

Resources	Date of search	Period searched*	Other restrictions	Number of records retrieved
Web of Science Core collection [§]	6 July 2021	2020-6 July 2021	None	67
CAB Abstracts [§]	6 July 2021	2020-6 July 2021	None	49
MEDLINE [§]	6 July 2021	2020-6 July 2021	None	35
Europe PMC [§]	6 July 2021	2020-6 July 2021	None	9
Screening reference lists	6 July 2021	-	2020-6 July 2021 [§]	0 **

[§] The search syntaxes used for electronic bibliographic databases are reported in Appendix 1.

NA: Not applicable as no publications relevant for screening reference lists were identified.

The publications retrieved across all methods of searching (Web of Science Core collection, CAB Abstracts, MEDLINE, Europe PMC, and screening of reference lists) can be found in Appendix 3.

In the framework of the reference list screening exercise, no detailed risk assessments regarding DAS-44406-6 soybean were retrieved that contained information on food and feed safety.

Considering that no opinions were published within the selected time period no further screening was performed.

The publications grouped in the Endnote® library were deduplicated. Publications retrieved by the previous searches conducted in the frame of the 2020 annual monitoring report were also removed (see Appendix 3, Section 6).

The results of the publication selection process are presented in Table 2.

Table 2. Results of the publication selection process, for the review question

Review question: “Does DAS-44406-6 soybean and derived food/feed products, or the intended traits (the newly expressed protein(s)), have adverse effects on human and animal health and the environment in the scope of the authorisation?”	Number of records
Total number of publications retrieved after all searches of the scientific literature (excluding duplicates and publications retrieved by the previous searches conducted in the frame of the 2020 monitoring reports)	51
Number of publications excluded from the search results after rapid assessment for relevance based on title and abstract	47
Total number of full-text documents assessed in detail	4
Number of publications excluded from further consideration after detailed assessment for relevance based on full text	4
Total number of unobtainable/unclear publications	0
Total number of relevant publications	0

The 51 unique entries present in the Endnote database (Table 2) were manually screened for relevance to the review question by two independent reviewers using the *a priori* eligibility/inclusion criteria described in Appendix 2.

In the first stage of screening, entries were screened based on title/abstract. Records that were deemed to be irrelevant were not further retained. In cases where the record seemed relevant, or if the title/abstract did not contain sufficient information, the publication was progressed to the second stage and assessed for relevance at the level of the full text.

Publications assessed at full text level and found not to be relevant were not further assessed and a justification was provided. Records that are relevant were summarized and their potential to influence the initial risk assessment was evaluated in the format laid out by the Commission decision 2009/770/EC (EC, 2009).

In this literature search exercise, no peer-reviewed publications relevant to the risk assessment of DAS-44406-6 soybean was identified (see Appendix 4, Table 4.1 and Table 3). Publications excluded after assessment of the full-text are presented in Table 4.2 in Appendix 4 and a reason for exclusion based on the eligibility/inclusion criteria is provided. No unclear publications were identified (see Appendix 4, Table 4.3).

4. Conclusion

No publications were identified as relevant for the molecular characterisation, food/feed and environmental safety of DAS-44406-6 soybean within the scope of the authorisations for the defined time period. No safety concerns have been identified for DAS-44406-6 soybean by this literature search exercise.

References

- EC, **2009**. Commission Decision 2009/770/EC of 13 October 2009 establishing standard reporting formats for presenting the monitoring results of the deliberate release into the environment of genetically modified organisms, as or in products, for the purpose of placing on the market, pursuant to Directive 2001/18/EC of the European Parliament and of the Council. Official Journal of the European Union 275, 9-27.
- EFSA, **2010**. Application of systematic review methodology to food and feed safety assessments to support decision making. EFSA Journal 8(6):1637. [90 pp.].
- EFSA, **2019**. Explanatory note on literature searching conducted in the context of GMO applications for (renewed) market authorisation and annual post-market environmental monitoring reports on GMOs authorised in the EU market. EFSA supporting publication 2019:EN-1614. [62 pp.].

Appendix 1. Detailed search syntaxes for the DAS-44406-6 soybean**Web of Science Core collection**

Set	Search query
Event #1	TS=(DAS44406* OR DAS-44406 OR DAS-44406-6 OR DAS-444-circle-divide-6-6 OR DAS-444empty-set6-6 OR ((44406 OR Enlist*) AND (soy* OR soja* OR Glycine OR Dow OR Corteva OR herbicid*)))
Proteins #2	TS=((2m-epsps OR 2mepsps OR ((5-enolpyruvylshikimate-3-phosphate-synthase OR epsps OR 5-enol-pyruvyl-shikimate-3-phosphate-synthase OR EPSP-synthase) AND modified AND protein AND (maize OR corn OR zea OR mays)) OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR aad-12 OR aryloxyalkanoate-dioxygenase-12) AND (Streptomyces OR viridochromogenes OR Delftia OR acidovorans OR soy* OR soja* OR glycine OR (((herbicid* AND (genetical* NEAR/3 modif*)) OR GMHT) AND (crop OR plant OR food OR feed)) OR gmo OR gmos OR lmo OR lmos OR gm OR ge))
Traits #3	TS=((glyphosate* OR Roundup OR "Round-up" OR glyfosate* OR gliphosate* OR glifosate* OR ((2-4-D OR AOPP) AND herbicid*) OR 2-4-dichlorophenoxyacetic-acid OR 2-4-dichlorophenoxy-acetic-acid OR aryloxyphenoxypropionate OR aryloxyphenoxy-propionate OR (fop AND (herbicid* OR aryloxyphen*)) OR quizalofop OR haloxyfop OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*)) AND (toler* OR resist* OR protect*) AND (soy* OR soja* OR Glycine OR max) AND (gmo OR gmos OR lmo OR lmos OR living-modified OR transgen* OR GMHT OR ((GM OR GE OR genetic*) NEAR/5 (modif* OR transform* OR manipulat* OR engineer*))))
#4	#1 OR #2 OR #3
Reporting Period #5	PY=(2020-2100)
Final Results #6	#4 AND #5

CAB Abstracts

Set	Search query
Event #1	TS=(DAS44406* OR DAS-44406 OR DAS-44406-6 OR DAS-44406-6 OR ((44406 OR Enlist*) AND (soy* OR soja* OR Glycine OR Dow OR Corteva OR herbicid*)))
Proteins #2	TS=((2m-epsps OR 2mepsps OR ((5-enolpyruvylshikimate-3-phosphate-synthase OR epsps OR 5-enol-pyruvyl-shikimate-3-phosphate-synthase OR EPSP-synthase) AND modified AND protein AND (maize OR corn OR zea OR mays)) OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR aad-12 OR aryloxyalkanoate-dioxygenase-12) AND (Streptomyces OR viridochromogenes OR Delftia OR acidovorans OR soy* OR soja* OR glycine OR (((herbicid* AND (genetical* NEAR/3 modif*)) OR GMHT) AND (crop OR plant OR food OR feed)) OR lmo OR lmos OR ge OR "genetically engineered foods"))
Traits #3	TS=((glyphosate* OR Roundup OR "Round-up" OR glyfosate* OR gliphosate* OR glifosate* OR ((2-4-D OR AOPP) AND herbicid*) OR 2-4-dichlorophenoxyacetic-acid OR 2-4-dichlorophenoxy-acetic-acid OR aryloxyphenoxypropionate OR aryloxyphenoxy-propionate OR (fop AND (herbicid* OR aryloxyphen*)) OR quizalofop OR haloxyfop OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*)) AND (toler* OR resist* OR protect*) AND (soy* OR soja* OR Glycine OR max) AND (GMHT OR transgen* OR engineer* OR lmo OR lmos OR ge OR manipulat* OR transform* OR "genetically engineered foods"))
#4	#1 OR #2 OR #3
Reporting Period #5	PY=(2020-2100)
Final Results #6	#4 AND #5

MEDLINE

Set	Search query
Event #1	TS=(DAS44406* OR DAS-44406 OR DAS-44406-6 OR ((44406 OR Enlist*) AND (soy* OR soja* OR Glycine OR Dow OR Corteva OR herbicid*)))
Proteins #2	TS=((2m-epsps OR 2mepsps OR ((5-enolpyruvylshikimate-3-phosphate-synthase OR epsps OR 5-enol-pyruvyl-shikimate-3-phosphate-synthase OR EPSP-synthase) AND modified AND protein AND (maize OR corn OR zea OR mays)) OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR aad-12 OR aryloxyalkanoate-dioxygenase-12) AND (Streptomyces OR viridochromogenes OR Delftia OR acidovorans OR soy* OR soja* OR glycine OR (((herbicid* AND (genetical* NEAR/3 modif*)) OR GMHT) AND (crop OR plant OR food OR feed)) OR lmo OR lmos OR ge OR "Food, Genetically Modified"))
Traits #3	TS=((glyphosate* OR Roundup OR "Round-up" OR glyfosate* OR gliphosate* OR glifosate* OR ((2-4-D OR AOPP) AND herbicid*) OR 2-4-dichlorophenoxyacetic-acid OR 2-4-dichlorophenoxy-acetic-acid OR aryloxyphenoxypropionate OR aryloxyphenoxy-propionate OR (fop AND (herbicid* or aryloxyphen*)) OR quizalofop OR haloxyfop OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*)) AND (toler* OR resist* OR protect*) AND (soy* OR soja* OR Glycine OR max) AND (GMHT OR transgen* OR engineer* OR lmo or lmos OR ge OR manipul* OR transform* OR "Food, Genetically Modified"))
#4	#1 OR #2 OR #3
Reporting Period #5	PY=(2020-2100)
Final Results #6	#4 AND #5

Europe PMC

(DAS44406 OR DAS44406 OR "das-44406" OR "das-44406" OR "44406 soy*" OR "44406 soy*" OR "soy* 44406" OR "soy* 44406" OR "Enlist E3") AND (FIRST_PDATE:[2020-01-01 TO 2020-12-31])

Appendix 2. Eligibility/Inclusion Criteria¹

Concept	Criteria
Population (taking into account scope of the authorisation)	<p>Publication addressing human and animal health, and/or the environment relevant for the scope of the authorisation.</p> <p>The pathways and level of exposure to the GMO, derived food/feed products, and the intended traits addressed in the study (as assessed under the Intervention/exposure part) are relevant for the intended uses of the GMO and derived food/feed products under regulatory review (e.g. in case of an authorisation for food, food, import, efficacy of the traits, pest susceptibility, etc. are not considered relevant).</p>
Intervention/exposure	DAS-44406-6 soybean and derived food/feed products, and/or the intended traits (the newly expressed protein(s)).
Intervention/exposure Plant species	In case of studies using GM plants, only studies using soybean are considered eligible. This criterion is not employed for studies regarding the newly expressed proteins.
Intervention/exposure Source organism of the protein	In case of publications using the protein of interest, only publications with the protein from the specific source organism will be considered eligible.
Comparator	If the study is a comparative study that uses plant material as test material, eligible publications must report a non-GM variety.
Outcomes	<p>Effects/impacts on human and animal health, and/or the environment are addressed.</p> <p>Publications addressing other issues such as benefits, socio-economics, ethics, crop protection, detection methods, efficacy, public perception and risk communication are to be excluded using this criterion, as they are not relevant to the risk assessment of GMOs.</p>
Reporting format	<p>Original/primary data are presented in the study. This permits the exclusion of publications that do not present original/primary data (e.g., reviews, editorial, position papers).</p> <p>However, risk assessments from relevant risk assessment bodies (excluding EFSA) will not be excluded.</p>

¹ This table is provided for ease of reference, no updates have been introduced since the previous report.

Appendix 3. Entries retrieved by the performed searches to literature databases for the DAS-44406-6 soybean within the indicated search period

Note: the numbering of the references in the different appendixes is independent of each other (e.g. a certain reference might be called EFSA 2021a in one appendix and EFSA 2021b in another)

1. Entries retrieved using Web of Science Core collection

- Albrecht AJP, de Brito I, Albrecht LP, Silva AFM, de Matos AKA, Carbonari CA and Velini ED, **2020**. Metabolic changes, agronomic performance, and quality of seeds in soybean with the pat gene after application of glufosinate. *Weed Science* 68, 594-604. 10.1017/wsc.2020.74
- Ali L, Jo H, Song JT and Lee JD, **2020**. The Prospect of Bentazone-Tolerant Soybean for Conventional Cultivation. *Agronomy-Basel* 10, 16. 10.3390/agronomy10111650
- Almeida MF, Tavares CS, Araujo EO, Picanco MC, Oliveira EE and Pereira EJG, **2021**. Plant Resistance in Some Modern Soybean Varieties May Favor Population Growth and Modify the Stylet Penetration of Bemisia tabaci (Hemiptera: Aleyrodidae). *Journal of Economic Entomology* 114, 970-978. 10.1093/jee/toab008
- Amin MR, Oh SD and Suh SJ, **2020**. Comparing the effects of GM and non-GM soybean varieties on non-target arthropods. *Entomological Research* 50, 423-432. 10.1111/1748-5967.12461
- Anderson JA, Mickelson J, Challender M, Moellring E, Sult T, TeRonde S, Walker C, Wang YW and Maxwell CA, **2020**. Agronomic and compositional assessment of genetically modified DP23211 maize for corn rootworm control. *Gm Crops & Food-Biotechnology in Agriculture and the Food Chain* 11, 206-214. 10.1080/21645698.2020.1770556
- Biazoto FS, Albrecht LP, Albrecht AJP, Silva AFM, Pereira VGC, Mundt TT, Baccin LC, Mattiuzzi MD and Pertuzati A, **2020**. AGRONOMIC PERFORMANCE AND CHLOROPHYLL INDICES OF TRANSGENIC SOYBEAN (with csr1-2 gene), UNDER IMAZAPIC/IMAZAPYR POST APPLICATION. *Pakistan Journal of Agricultural Sciences* 57, 1223-1229. 10.21162/pakjas/20.9821
- Bonini EA, Marchiosi R, Zonetti PD, Zobiole LHS and Ferrarese O, **2020**. CHROMATOGRAPHIC DETERMINATION OF SHIKIMATE FOR IDENTIFICATION OF CONVENTIONAL SOYBEAN AND GLYPHOSATE RESISTANT SOYBEAN. *Bioscience Journal* 36, 383-389. 10.14393/BJ-v36n2a2020-42339
- Boonchaisri S, Rochfort S, Stevenson T and Dias DA, **2021**. LC-MS untargeted metabolomics assesses the delayed response of glufosinate treatment of transgenic glufosinate resistant (GR) buffalo grasses (*Stenotaphrum secundatum* L.). *Metabolomics* 17, 17. 10.1007/s11306-021-01776-5
- Carlson AB, Mukerji P, Mathesius CA, Huang E, Herman R, Hoban D, Thurman JD and Roper JM, **2020**. DP-2empty set2216-6 maize does not adversely affect rats in a 90-day feeding study. *Regulatory Toxicology and Pharmacology* 117, 7. 10.1016/j.yrtph.2020.104779
- Chen P, Shannon G, Ali ML, Scaboo A, Crisel M, Smothers S, Clubb M, Selves S, Vieira CC, Mitchum MG, Nguyen HT, Li Z, Bond J, Meinhardt C, Usovsky M, Li S, Mengistu A and Robbins RT, **2020**. Registration of 'S14-9017GT' soybean cultivar with high yield, resistance to multiple diseases, and high seed oil content. *Journal of Plant Registrations* 14, 347-356. 10.1002/plr2.20011
- Cicchillo RM, Beeson WT, McCaskill DG, Shan G, Herman R and Walsh TA, **2020**. Identification of iron-chelating phenolics contributing to seed coat coloration in soybeans (*Glycine max* (L.) Merr.) expressing aryloxyalkanoate dioxygenase-12.

- Phytochemistry 172, 11. 10.1016/j.phytochem.2020.112279
- da Costa LF, Tormena CF and Arruda MAZ, **2021**. Ionomics and lipidomics for evaluating the transgenic (cp4-EPSPS gene) and non-transgenic soybean seed generations. *Microchemical Journal* 165, 8. 10.1016/j.microc.2021.106130
- Du Y, Chen FS, Chen C and Liu KL, **2020**. Monitoring and traceability of genetically modified soya bean event GTS 40-3-2 during soya bean protein concentrate and isolate preparation. *Royal Society Open Science* 7, 12. 10.1098/rsos.201147
- Du Y, Chen FS, Bu GH and Zhang LF, **2021**. Distribution and degradation of DNA from non-genetically and genetically modified soybean (Roundup Ready): Impact of soybean protein concentrate and soybean protein isolate preparation. *Food Chemistry* 335, 9. 10.1016/j.foodchem.2020.127582
- Farias ME, Marani MM, Ramirez D, Niebyski AM, Correa NM and Molina PG, **2020**. Polyclonal antibody production anti Pc₃₁₂₋₃₂₄ peptide. Its potential use in electrochemical immunosensors for transgenic soybean detection. *Bioelectrochemistry* 131, 8. 10.1016/j.bioelechem.2019.107397
- Fast BJ, Shan GM, Gampala SS and Herman R, **2020**. Transgene expression in sprayed and non-sprayed herbicide-tolerant genetically engineered crops is equivalent. *Regulatory Toxicology and Pharmacology* 111, 8. 10.1016/j.yrtph.2019.104572
- Finley JW and Duke SO, **2020**. Agnes Rimando, a Pioneer in the Fate of Glyphosate and Its Primary Metabolite in Plants. *Journal of Agricultural and Food Chemistry* 68, 5623-5630. 10.1021/acs.jafc.0c00811
- Garcia JR, Vargas AAM, Perboni LT, Souza EA, Tessaro D, Lucio FR and Agostinetto D, **2020**. Physiological attributes of Enlist E3 (TM) soybean seed submitted to herbicides application. *Planta Daninha* 38, 6. 10.1590/s0100-83582020380100088
- Girgan C, Claassens S and Fourie H, **2020**. Nematode assemblages and soil microbial communities in soils associated with glyphosate-resistant soybean. *South African Journal of Plant and Soil* 37, 11-22. 10.1080/02571862.2019.1640297
- Greenleaf M, **2020**. Rubber and Carbon: Opportunity Costs, Incentives and Ecosystem Services in Acre, Brazil. *Development and Change* 51, 51-72. 10.1111/dech.12543
- Gruber K, Courteau B, Bokhoree M, McMahon E, Kotz J and Nienow A, **2021**. Photolysis of the herbicide dicamba in aqueous solutions and on corn (*Zea mays*) epicuticular waxes. *Environmental Science-Processes & Impacts* 23, 786-802. 10.1039/d1em00058f
- Guo BF, Hong HL, Han JN, Zhang LJ, Liu ZX, Guo Y and Qiu LJ, **2020**. Development and identification of glyphosate-tolerant transgenic soybean via direct selection with glyphosate. *Journal of Integrative Agriculture* 19, 1186-1196. 10.1016/s2095-3119(19)62747-4
- Jhala AJ, Beckie HJ, Peters TJ, Culpepper AS and Norsworthy JK, **2021**. Interference and management of herbicide-resistant crop volunteers. *Weed Science* 69, 257-273. 10.1017/wsc.2021.3
- Karthik K, Nandiganti M, Thangaraj A, Singh S, Mishra P, Rathinam M, Sharma M, Singh NK, Dash PK and Sreevathsa R, **2020**. Transgenic Cotton (*Gossypium hirsutum* L.) to Combat Weed Vagaries: Utility of an Apical Meristem-Targeted in planta Transformation Strategy to Introgress a Modified CP4-EPSPS Gene for Glyphosate Tolerance. *Frontiers in Plant Science* 11, 11. 10.3389/fpls.2020.00768
- Liu WX, Li L, Zhang Z, Dong M and Jin WJ, **2020**. iTRAQ-based quantitative proteomic analysis of transgenic and non-transgenic maize seeds. *Journal of Food Composition and Analysis* 92, 11. 10.1016/j.jfca.2020.103564
- Liu JY, Sheng ZW, Hu YQ, Liu Q, Qiang S, Song XL and Liu B, **2021**. Fitness of F1 hybrids between 10 maternal wild soybean populations and transgenic soybean.

- Transgenic Research 30, 105-119. 10.1007/s11248-020-00230-x
- Liu WX, Zhao HM, Miao CH and Jin WJ, **2021**. Integrated proteomics and metabolomics analysis of transgenic and gene-stacked maize line seeds. *Gm Crops & Food-Biotechnology in Agriculture and the Food Chain* 12, 361-375. 10.1080/21645698.2021.1934351
- Luan HX, Liao WL, Song YP, Niu HP, Hu T and Zhi HJ, **2020**. Transgenic plant generated by RNAi-mediated knocking down of soybean Vma12 and soybean mosaic virus resistance evaluation. *AMB Express* 10, 10. 10.1186/s13568-020-00997-6
- Machado EP, Rodrigues GL, Somavilla JC, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Survival and development of *Spodoptera eridania*, *Spodoptera cosmioidea* and *Spodoptera albula* (Lepidoptera: Noctuidae) on genetically-modified soybean expressing Cry1Ac and Cry1F proteins. *Pest Management Science* 76, 4029-4035. 10.1002/ps.5955
- Machado EP, Rodrigues GLD, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Cross-crop resistance of *Spodoptera frugiperda* selected on Bt maize to genetically-modified soybean expressing Cry1Ac and Cry1F proteins in Brazil. *Scientific Reports* 10, 9. 10.1038/s41598-020-67339-1
- Masotti F, Garavaglia BS, Piazza A, Burdisso P, Altabe S, Gottig N and Ottado J, **2021**. Bacterial isolates from Argentine Pampas and their ability to degrade glyphosate. *Science of the Total Environment* 774, 12. 10.1016/j.scitotenv.2021.145761
- Mbatyoti A, Daneel MS, Swart A, Marais M, De Waele D and Fourie H, **2020**. Plant-parasitic nematode assemblages associated with glyphosate tolerant and conventional soybean cultivars in South Africa. *African Zoology* 55, 93-107. 10.1080/15627020.2019.1679040
- Mbatyoti A, De Beer A, Daneel MS, Swart A, Marais M, De Waele D and Fourie H, **2021**. The host status of glyphosate-tolerant soybean genotypes to *Meloidogyne incognita* and *Pratylenchus* infection. *Tropical Plant Pathology* 46, 336-349. 10.1007/s40858-020-00416-y
- Mendes RR, Franchini LHM, Lucio FR, Zobiolo LHS and Oliveira RS, **2020**. Aryloxyphenoxypropionates tolerant and non-tolerant corn: plant-back interval after acetyl-coA-carboxylase inhibitors applications. *Planta Daninha* 38, 8. 10.1590/50100-83582020380100062
- Meyer CJ, Norsworthy JK and Kruger GR, **2020**. What antagonistic interactions mean for Enlist and Roundup Ready Xtend technologies. *Crop Forage & Turfgrass Management* 6, 12. 10.1002/cft2.20044
- Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank L, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez-Alfageme F, Ardizzone M, Dumont AF, Devos Y, Gennaro A, Ruiz JAG, Lanzoni A, Neri FM, Paraskevopoulos K and Or EPGM, **2020**. Assessment of genetically modified soybean SYHT0H2 for food and feed uses, import and processing, under Regulation (EC) No 1829/2003 (application EFSA-GMO-DE-2012-111). *Efsa Journal* 18, 29. 10.2903/j.efsa.2020.5946
- Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, De Sanctis G, Devos Y, Dumont AF, Federici S, Gennaro A, Ruiz JAG, Lanzoni A, Neri FM, Papadopoulou N, Paraskevopoulos K, Raffaello T and Modified EPG, **2020**. Scientific Opinion on application EFSA-GMO-NL-2016-132 for authorisation of genetically modified of

- insect-resistant and herbicide-tolerant soybean DAS-81419-2 x DAS-44406-6 for food and feed uses, import and processing submitted in accordance with Regulation (EC) No 1829/2003 by Dow Agrosiences LCC. *Efsa Journal* 18, 37. 10.2903/j.efsa.2020.6302
- Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, De Sanctis G, Dumont A, Devos Y, Gennaro A, Ruiz JAG, Lanzoni A, Neri FM, Papadopoulou N, Paraskevopoulos K, Raffaello T and Modified EPG, **2020**. Assessment of genetically modified soybean MON 87705 x MON 87708 x MON 89788, for food and feed uses, under Regulation (EC) No 1829/2003 (application EFSA-GMO-NL-2015-126). *Efsa Journal* 18, 36. 10.2903/j.efsa.2020.6111
- Pan L, Yu Q, Wang JZ, Han HP, Mao LF, Nyporko A, Maguza A, Fan LJ, Bai LY and Powles S, **2021**. An ABCC-type transporter endowing glyphosate resistance in plants. *Proceedings of the National Academy of Sciences of the United States of America* 118, 11. 10.1073/pnas.2100136118
- Pareddy D, Chennareddy S, Anthony G, Sardesai N, Mall T, Minnicks T, Karpova O, Clark L, Griffin D, Bishop B, Shumway N, Samuel P, Smith K and Sarria R, **2020**. Improved soybean transformation for efficient and high throughput transgenic production. *Transgenic Research* 29, 267-281. 10.1007/s11248-020-00198-8
- Pereira JL, Pereira RR, Resende-Silva GA, Jakelaitis A, Silva AA and Picanco MC, **2020**. GLYPHOSATE IMPACT ON ARTHROPODS ASSOCIATED TO ROUNDUP READY AND CONVENTIONAL SOYBEAN (*Glycine max* L.). *Planta Daninha* 38, 11. 10.1590/s0100-83582020380100047
- Petineli R, Moraes LAC, Heinrichs R, Moretti LG and Moreira A, **2020**. Conventional and Transgenic Soybeans: Physiological and Nutritional Differences in Productivity under Sulfur Fertilization. *Communications in Soil Science and Plant Analysis* 51, 2045-2053. 10.1080/00103624.2020.1822387
- Piccini C, Fazi S, Perez G, Batani G, de la Escalera GM and Sotelo-Silveira JR, **2020**. Resistance to degradation and effect of the herbicide glyphosate on the bacterioplankton community of a large river system dominated by agricultural activities. *Marine and Freshwater Research* 71, 1026-1032. 10.1071/mf19079
- Qian BJ, Huang L, Zhao J and Zhu J, **2021**. Analysis of physiochemical composition and antioxidant properties between hulls of the genetically modified glyphosate-tolerant soybean and northeast soybean. *Food Science and Biotechnology* 30, 505-512. 10.1007/s10068-021-00894-z
- Ranjan PN, Ram CJ, Anurag T, Nilesh J, Kumar PB, Suresh Y, Santosh K and Rahul K, **2020**. Breeding for herbicide tolerance in crops: a review. *Research Journal of Biotechnology* 15, 154-162.
- Rodrigues NR, de Souza APF, Morais PPP, Braga DPV, Crivellari AC, Favoretto LRG and Berger GU, **2021**. Residues of glyphosate and aminomethylphosphonic acid (AMPA) in genetically modified glyphosate tolerant soybean, corn and cotton crops. *Ciencia Rural* 51, 13. 10.1590/0103-8478cr20190244
- Samples CA, Kruger GR, Dodds DM, Irby JT, Reynolds DB and Catchot AL, **2021**. Injury Potential from Herbicide Combinations in Enlist (R) Cotton. *Journal of Cotton Science* 25, 51-57.
- Seok J, Kim YJ, Kim IK and Kim KJ, **2020**. Structural basis for stereospecificity to D-amino acid of glycine oxidase from *Bacillus cereus* ATCC 14579. *Biochemical and Biophysical Research Communications* 533, 824-830. 10.1016/j.bbrc.2020.09.093
- Seralini GE, **2020**. Update on long-term toxicity of agricultural GMOs tolerant to roundup.

- Environmental Sciences Europe 32, 7. 10.1186/s12302-020-0296-8
- Shang Y, Zhang BY, Zhu LY, Huang KL and Xu WT, **2020**. A novel quantitative technique in detecting stacked genetically modified plants by fluorescent-immunohistochemistry. *Journal of Food Composition and Analysis* 88, 5. 10.1016/j.jfca.2020.103452
- Shin WR, Lee MJ, Sekhon SS, Kim JH, Kim SC, Cho BK, Ahn JY and Kim YN, **2020**. Aptamer-linked immobilized sorbent assay for detecting GMO marker, phosphinothricin acetyltransferase (PAT). *Molecular & Cellular Toxicology* 16, 253-261. 10.1007/s13273-020-00087-5
- Shyam C, Chahal PS, Jhala AJ and Jugulam M, **2021**. Management of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in 2,4-D-, glufosinate-, and glyphosate-resistant soybean. *Weed Technology* 35, 136-143. 10.1017/wet.2020.91
- Singh M, Randhawa G, Bhoge RK, Singh S, Kak A and Sangwan O, **2020**. Monitoring Adventitious Presence of Transgenes in Cotton Collections from Genebank and Experimental Plots: Ensuring GM-Free Conservation and Cultivation of Genetic Resources. *Agricultural Research* 9, 469-476. 10.1007/s40003-019-00449-z
- Soga K, Kimata S, Narushima J, Sato S, Sato E, Mano J, Takabatake R, Kitta K, Kawakami H, Akiyama H, Kondo K and Nakamura K, **2020**. Development and Testing of an Individual Kernel Detection System for Genetically Modified Soybean Events in Non-identity-preserved Soybean Samples. *Biological & Pharmaceutical Bulletin* 43, 1259-1266. 10.1248/bpb.b20-00382
- Striegel A, Lawrence NC, Knezevic SZ, Krumm JT, Hein G and Jhala AJ, **2020**. Control of glyphosate/glufosinate-resistant volunteer corn in corn resistant to aryloxyphenoxypropionates. *Weed Technology* 34, 309-317. 10.1017/wet.2020.41
- Swatkoski SJ and Croley TR, **2020**. Screening of Processed Foods for Transgenic Proteins from Genetically Engineered Plants Using Targeted Mass Spectrometry. *Analytical Chemistry* 92, 3455-3462. 10.1021/acs.analchem.9b05577
- Takano HK, Beffa R, Preston C, Westra P and Dayan FE, **2020**. Glufosinate enhances the activity of protoporphyrinogen oxidase inhibitors. *Weed Science* 68, 324-332. 10.1017/wsc.2020.39
- Vieira BC, Butts TR, Rodrigues AO, Schleier JJ, Fritz BK and Kruger GR, **2020**. Particle drift potential of glyphosate plus 2,4-D choline pre-mixture formulation in a low-speed wind tunnel. *Weed Technology* 34, 520-527. 10.1017/wet.2020.15
- Wheeler TA, Siders K, Monclova-Santana C and Dever JK, **2020**. The relationship between commercial cotton cultivars with varying *Meloidogyne incognita* resistance genes and yield. *Journal of nematology* 52, 8. 10.21307/jofnem-2020-064
- Yang MK, Wen ZL, Fazal A, Hua XM, Xu XH, Yin TM, Qi JL, Yang RW, Lu GH, Hong Z and Yang YH, **2020**. Impact of a G2-EPSPS & GAT Dual Transgenic Glyphosate-Resistant Soybean Line on the Soil Microbial Community under Field Conditions Affected by Glyphosate Application. *Microbes and Environments* 35, 10. 10.1264/jsme2.ME20056
- Ye ZW, Wu F and Hennessy DA, **2021**. Environmental and economic concerns surrounding restrictions on glyphosate use in corn. *Proceedings of the National Academy of Sciences of the United States of America* 118, 9. 10.1073/pnas.2017470118
- Yook MJ, Park HR, Zhang CJ, Lim SH, Jeong SC, Chung YS and Kim DS, **2021**. Environmental risk assessment of glufosinate-resistant soybean by pollen-mediated gene flow under field conditions in the region of the genetic origin. *Science of the Total Environment* 762, 11. 10.1016/j.scitotenv.2020.143073
- Zanatta CB, Benevenuto RF, Nodari RO and Agapito-Tenfen SZ, **2020**. Stacked genetically modified soybean harboring herbicide resistance and insecticide rCry1Ac shows

- strong defense and redox homeostasis disturbance after glyphosate-based herbicide application. *Environmental Sciences Europe* 32, 17. 10.1186/s12302-020-00379-6
- Zeng HJ, Wang JB, Jia JW, Wu GG, Yang QW, Liu XF and Tang XM, **2021**. Development of a lateral flow test strip for simultaneous detection of BT-Cry1Ab, BT-Cry1Ac and CP4 EPSPS proteins in genetically modified crops. *Food Chemistry* 335, 7. 10.1016/j.foodchem.2020.127627
- Zhang L, Li SF, Zhou QH, Liu YH, Zhang J and Qian ZY, **2021**. Subchronic toxicity study in rats evaluating herbicide-tolerant soybean DAS-68416-4. *Regulatory Toxicology and Pharmacology* 119, 8. 10.1016/j.yrtph.2020.104833
- Zhang L, Shen WJ, Fang ZX and Liu B, **2021**. Effects of genetically modified maize expressing Cry1Ab and EPSPS proteins on Japanese quail. *Poultry Science* 100, 1068-1075. 10.1016/j.psj.2020.11.014
- Zhou CZ, Luo XX, Chen NY, Zhang LL and Gao JT, **2020**. C-P Natural Products as Next-Generation Herbicides: Chemistry and Biology of Glufosinate. *Journal of Agricultural and Food Chemistry* 68, 3344-3353. 10.1021/acs.jafc.0c00052

2. Entries retrieved using CAB Abstracts

- Albrecht AJP, Brito IPFSd, Albrecht LP, Silva AFM, Matos AKAd, Carbonari CA and Velini ED, **2020**. Metabolic changes, agronomic performance, and quality of seeds in soybean with the Pat gene after application of glufosinate. *Weed Science* 68, 594-604. 10.1017/wsc.2020.74
- Almeida MF, Tavares CS, Araujo EO, Picanco MC, Oliveira EE and Pereira EJG, **2021**. Plant resistance in some modern soybean varieties may favor population growth and modify the stylet penetration of *Bemisia tabaci* (Hemiptera: Aleyrodidae). *Journal of Economic Entomology* 114, 970-978. 10.1093/jee/toab008
- Anderson JA, Mickelson J, Challender M, Moellring E, Sult T, Teronde S, Walker C, Wang Y and Maxwell CA, **2020**. Agronomic and compositional assessment of genetically modified DP23211 maize for corn rootworm control. *GM Crops and Food: Biotechnology in Agriculture and the Food Chain* 11, 206-214. 10.1080/21645698.2020.1770556
- Basavaraju SN, Lakshmikanth RY and Udayakumar M, **2020**. A modified in-planta transformation technique to generate stable gain-in function transformants in a recalcitrant indica rice genotype. *Plant Physiology Reports* 25, 231-244. 10.1007/s40502-020-00517-5
- Bonini EA, Marchiosi R, Zonetti PdC, Zobiolo LHS and Ferrarese Filho O, **2020**. Chromatographic determination of shikimate for identification of conventional soybean and glyphosate resistant soybean. *Bioscience Journal* 36, 383-389. 10.14393/BJ-v36n2a2020-42339
- Carlson AB, Mukerji P, Mathesius CA, Huang E, Herman RA, Hoban D, Thurman JD and Roper JM, **2020**. DP-202216-6 maize does not adversely affect rats in a 90-day feeding study. *Regulatory Toxicology and Pharmacology* 117. 10.1016/j.yrtph.2020.104779
- Carvalho SJPd, Picoli Junior GJ and Ovejero RFL, **2020**. Chemical control of soybean and cotton volunteer plants resistant to dicamba
- Controle químico de plantas voluntárias de soja e algodão tolerantes a dicamba. *Revista Brasileira de Herbicidas* 19. 10.7824/rbh.v19i2.695
- Chen P, Shannon G, Ali ML, Scaboo A, Crisel M, Smothers S, Clubb M, Selves S, Vieira CC, Mitchum MG, Nguyen HT, Li Z, Bond J, Meinhardt C, Usovsky M, Li S, Mengistu A and Robbins RT, **2020**. Registration of 'S14-9017GT' soybean cultivar with high yield, resistance to multiple diseases, and high seed oil content. *Journal of Plant Registrations* 14, 347-356. 10.1002/plr2.20011

- Chen Y, Liu L, Guan X and Liu B, **2020**. Impact of transgenic herbicide-resistant soybean on the diversity of arthropods and weeds in soybean fields. *Acta Entomologica Sinica* 63, 1366-1376. 10.16380/j.kcxb.2020.11.009
- Cicchillo RM, Beeson WT, McCaskill DG, Shan G, Herman RA and Walsh TA, **2020**. Identification of iron-chelating phenolics contributing to seed coat coloration in soybeans (*Glycine max* (L.) Merr.) expressing aryloxyalkanoate dioxygenase-12. *Phytochemistry* 172. 10.1016/j.phytochem.2020.112279
- Du Y, Chen F, Chen C and Liu K, **2020**. Monitoring and traceability of genetically modified soya bean event GTS 40-3-2 during soya bean protein concentrate and isolate preparation. *Royal Society Open Science* 7. 10.1098/rsos.201147
- Du Y, Chen F, Bu G and Zhang L, **2021**. Distribution and degradation of DNA from non-genetically and genetically modified soybean (Roundup ready): impact of soybean protein concentrate and soybean protein isolate preparation. *Food Chemistry* 335. 10.1016/j.foodchem.2020.127582
- Farias ME, Marani MM, Ramirez D, Niebylski AM, Correa NM and Molina PG, **2020**. Polyclonal antibody production anti Pc_312-324 peptide. Its potential use in electrochemical immunosensors for transgenic soybean detection. *Bioelectrochemistry* 131, Article 107397. 10.1016/j.bioelechem.2019.107397
- Ferreira Costa Ld, Francisco Tormena C and Aurelio Zezzi Arruda M, **2021**. Ionomics and lipidomics for evaluating the transgenic (cp 4-epsps gene) and non-transgenic soybean seed generations. *Microchemical Journal* 165. 10.1016/j.microc.2021.106130
- Finley JW and Duke SO, **2020**. Agnes Rimando, a pioneer in the fate of glyphosate and its primary metabolite in plants. *Journal of Agricultural and Food Chemistry* 68, 5623-5630. 10.1021/acs.jafc.0c00811
- Garcia JR, Vargas AAM, Perboni LT, Souza EA, Tessaro D, Lucio FR and Agostinetto D, **2020**. Physiological attributes of enlist E3 soybean seed submitted to herbicides application. *Planta Daninha* 38. 10.1590/s0100-83582020380100088
- Girgan C, Claassens S and Fourie H, **2020**. Nematode assemblages and soil microbial communities in soils associated with glyphosate-resistant soybean. *South African Journal of Plant and Soil* 37, 11-22. 10.1080/02571862.2019.1640297
- Guo B, Hong H, Han J, Zhang L, Liu Z, Guo Y and Qiu L, **2020**. Development and identification of glyphosate-tolerant transgenic soybean via direct selection with glyphosate. *Journal of Integrative Agriculture* 19, 1186-1196. 10.1016/s2095-3119(19)62747-4
- Hill ZT, Barber LT, Doherty RC, Collie LM and Ross A, **2020**. Prickly sida and grass species control in xtend and enlist soybean systems. *BR Wells Rice Research Studies - Arkansas Agricultural Experiment Station, University of Arkansas System* 159-161.
- Jamshidnia M, Kazemitabar SK, Lindermayr C and Zarini HN, **2020**. Transformation of *Nicotiana tabacum* using the herbicide resistance bar gene as a selectable marker. *Acta Horticulturae* 455-461. 10.17660/ActaHortic.2020.1297.60
- Jing W, Yong G and Lijuan Q, **2020**. Establishment and application of multiple PCR detection system for glyphosate-tolerant gene EPSPS/GAT in soybean. *Scientia Agricultura Sinica* 53, 4127-4136. 10.3864/j.issn.0578-1752.2020.20.003
- Kesiraju K, Muralimohan N, Arulprakash T, Shweta S, Pragya M, Maniraj R, Manju S, Singh NK, Dash PK and Rohini S, **2020**. Transgenic cotton (*Gossypium hirsutum* L.) to combat weed vagaries: utility of an apical meristem-targeted in planta transformation strategy to introgress a modified CP4-EPSPS gene for glyphosate tolerance. *Frontiers in Plant Science* 11. 10.3389/fpls.2020.00768

- Liu J, Sheng Z, Hu Y, Liu Q, Qiang S, Song X and Liu B, **2021**. Fitness of F1 hybrids between 10 maternal wild soybean populations and transgenic soybean. *Transgenic Research* 30, 105-119. 10.1007/s11248-020-00230-x
- Luan H, Liao W, Song Y, Niu H, Hu T and Zhi H, **2020**. Transgenic plant generated by RNAi-mediated knocking down of soybean Vma12 and Soybean mosaic virus resistance evaluation. *AMB Express* 10. 10.1186/s13568-020-00997-6
- Machado EP, Rodrigues Junior GLSd, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Cross-crop resistance of *Spodoptera frugiperda* selected on Bt maize to genetically-modified soybean expressing Cry1Ac and Cry1F proteins in Brazil. *Scientific Reports* 10. 10.1038/s41598-020-67339-1
- Machado EP, S Rodrigues Junior GLd, Somavilla JC, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Survival and development of *Spodoptera eridania*, *Spodoptera cosmioides* and *Spodoptera albula* (Lepidoptera: Noctuidae) on genetically-modified soybean expressing Cry1Ac and Cry1F proteins. *Pest Management Science* 76, 4029-4035. 10.1002/ps.5955
- McCormick AN, Smith LG, Dillon TW, Collie LM, Davis BM and Butts TR, **2020**. Nozzle type effect on coverage and canopy penetration using enlist one and liberty in enlist e3 soybean. *BR Wells Rice Research Studies - Arkansas Agricultural Experiment Station, University of Arkansas System* 140-145.
- Mendes RR, Franchini LHM, Lucio FR, Zobiolo LHS and Oliveira RS, Jr., **2020**. Aryloxyphenoxypropionates tolerant and non-tolerant corn: plant-back interval after acetyl-coA-carboxylase inhibitors applications. *Planta Daninha* 38. 10.1590/s0100-83582020380100062
- Meyer CJ, Norsworthy JK and Kruger GR, **2020**. What antagonistic interactions mean for Enlist and Roundup Ready Xtend technologies. *Crop, Forage & Turfgrass Management* 6. 10.1002/cft2.20044
- Monika S, Gurinderjit R, Bhoge RK, Sushmita S, Anjali K and Omender S, **2020**. Monitoring adventitious presence of transgenes in cotton collections from Genebank and experimental plots: ensuring GM-free conservation and cultivation of genetic resources. *Agricultural Research* 9, 469-476. 10.1007/s40003-019-00449-z
- Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, Dumont AF, Devos Y, Gennaro A, Ruiz JAG, Lanzoni A, Neri FM and Paraskevopoulos K, **2020**. Assessment of genetically modified soybean SYHT0H2 for food and feed uses, import and processing, under Regulation (EC) No 1829/2003 (application EFSA-GMO-DE-2012-111). *Efsa Journal* 18, e05946.
- Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, Sanctis Gd, Devos Y, Dumont AF, Federici S, Gennaro A, Ruiz JAG, Lanzoni A and et al., **2020**. Scientific opinion on application EFSA-GMO-NL-2016-132 for authorisation of genetically modified of insect-resistant and herbicide-tolerant soybean das-81419-2 * DAS-44406-6 for food and feed uses, import and processing submitted in accordance with Regulation (EC) no 1829/2003 by Dow Agrosiences LCC. *Efsa Journal* 18. 10.2903/j.efsa.2020.6302
- Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, Sanctis Gd, Dumont A, Devos

- Y, Gennaro A, Ruiz JAG, Lanzoni A, Neri FM, Papadopoulou N and et al., **2020**. Assessment of genetically modified soybean MON 87705 * MON 87708 * MON 89788, for food and feed uses, under regulation (ec) no 1829/2003 (application EFSA -GMO -NL -2015-126). *Efsa Journal* 18. 10.2903/j.efsa.2020.6111
- Oh S, Park S, Lee S, Yun D, Lee G and Suh S, **2020**. Influence of vitamin A-enhanced transgenic soybean cultivation on the diversity of insects in LMO quarantine fields. *Korean Journal of Breeding Science* 52, 310-321. 10.9787/kjbs.2020.52.4.310
- Pareddy D, Chennareddy S, Anthony G, Sardesai N, Mall T, Minnicks T, Karpova O, Clark L, Griffin D, Bishop B, Shumway N, Samuel P, Smith K and Sarria R, **2020**. Improved soybean transformation for efficient and high throughput transgenic production. *Transgenic Research* 29, 267-281. 10.1007/s11248-020-00198-8
- Pavlovic S, Savic J, Milojevic J, Vinterhalter B, Girek Z, Adzic S, Zecevic B and Banjac N, **2020**. Introduction of the nicotiana protein kinase (NPK1) gene by combining *Agrobacterium*-mediated transformation and recurrent somatic embryogenesis to enhance salt tolerance in cauliflower. *Plant Cell, Tissue and Organ Culture* 143, 635-651. 10.1007/s11240-020-01948-6
- Pereira JL, Pereira RR, Resende-Silva GA, Jakelaitis A, Silva AA and Picanco MC, **2020**. Glyphosate impact on arthropods associated to roundup ready and conventional soybean (*Glycine max* L.). *Planta Daninha* 38. 10.1590/s0100-83582020380100047
- Petineli R, Moraes LAC, Heinrichs R, Moretti LG and Moreira A, **2020**. Conventional and transgenic soybeans: physiological and nutritional differences in productivity under sulfur fertilization. *Communications in Soil Science and Plant Analysis* 51, 2045-2053. 10.1080/00103624.2020.1822387
- Seralini GE, **2020**. Update on long-term toxicity of agricultural GMOs tolerant to Roundup. *Environmental Sciences Europe* 32. 10.1186/s12302-020-0296-8
- Shyam C, Chahal PS, Jhala AJ and Jugulam M, **2020**. Management of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in 2,4-D-, glufosinate-, and glyphosate-resistant soybean. *Weed Technology* 35, 136-143. 10.1017/wet.2020.91
- Takahashi GO, Braz GBP, Machado FG, Barroso ALdL and Solino AJdS, **2020**. Control of voluntary soybean plants with herbicides recommended for cotton
- Controle de soja voluntaria com herbicidas registrados para algodoeiro. *Revista Brasileira de Herbicidas* 19. 10.7824/rbh.v19i4.707
- Tauhata SBF, Araujo GBd, Oliveira Alves SDFd, Martins DNV, Lopes LS and Casaletti L, **2020**. The glyphosate controversy: an update. *Arquivos do Instituto Biologico (Sao Paulo)* 87. 10.1590/1808-1657001002018
- Vieira BC, Butts TR, Rodrigues AO, Schleier JJS, III, Fritz BK and Kruger GR, **2020**. Particle drift potential of glyphosate plus 2,4-D choline pre-mixture formulation in a low-speed wind tunnel. *Weed Technology* 34, 520-527. 10.1017/wet.2020.15
- Yang M, Wen Z, Fazal A, Hua X, Xu X, Yin T, Qi J, Yang R, Lu G, Hong Z and Yang Y, **2020**. Impact of a G2-EPSPS & GAT dual transgenic glyphosate-resistant soybean line on the soil microbial community under field conditions affected by glyphosate application. *Microbes and Environments* 35. 10.1264/jsme2.ME20056
- Yook M, Park H, Zhang C, Lim S, Jeong S, Chung Y and Kim D, **2021**. Environmental risk assessment of glufosinate-resistant soybean by pollen-mediated gene flow under field conditions in the region of the genetic origin. *Science of the Total Environment* 762. 10.1016/j.scitotenv.2020.143073
- Yu H, Jia F, Quan Z, Cui H, Li X, Huilin Y, Fang J, Zonghua Q, Hailan C and Xiangju L, **2020**. Effects of glyphosate on weed control, soybean safety and weed occurrence in transgenic herbicide-resistant soybean. *Scientia Agricultura Sinica* 53, 1166-1177. 10.3864/j.issn.0578-1752.2020.06.008

- Zanatta CB, Benevenuto RF, Nodari RO and Agapito-Tenfen SZ, **2020**. Stacked genetically modified soybean harboring herbicide resistance and insecticide rCry1ac shows strong defense and redox homeostasis disturbance after glyphosate-based herbicide application. *Environmental Sciences Europe* 32, (25 July 2020). 10.1186/s12302-020-00379-6
- Zeng H, Wang J, Jia J, Wu G, Yang Q, Liu X and Tang X, **2021**. Development of a lateral flow test strip for simultaneous detection of BT-Cry1Ab, BT-Cry1Ac and CP4 EPSPS proteins in genetically modified crops. *Food Chemistry* 335. 10.1016/j.foodchem.2020.127627
- Zhang L, Li S, Zhou Q, Liu Y, Zhang J and Qian Z, **2021**. Subchronic toxicity study in rats evaluating herbicide-tolerant soybean DAS-68416-4. *Regulatory Toxicology and Pharmacology* 119. 10.1016/j.yrtph.2020.104833

3. Entries retrieved using MEDLINE

- Achary VMM, Sheri V, Manna M, Panditi V, Borphukan B, Ram B, Agarwal A, Fartyal D, Teotia D, Masakapalli SK, Agrawal PK and Reddy MK, **2020**. Overexpression of improved EPSPS gene results in field level glyphosate tolerance and higher grain yield in rice. *Plant Biotechnology Journal* 18, 2504-2519. 10.1111/pbi.13428
- Almeida MF, Tavares CS, Araujo EO, Picanco MC, Oliveira EE and Pereira EJG, **2021**. Plant Resistance in Some Modern Soybean Varieties May Favor Population Growth and Modify the Stylet Penetration of *Bemisia tabaci* (Hemiptera: Aleyrodidae). *Journal of Economic Entomology* 114, 970-978. 10.1093/jee/toab008
- Anderson JA, Mickelson J, Challender M, Moelling E, Sult T, TeRonde S, Walker C, Wang Y and Maxwell CA, **2020**. Agronomic and compositional assessment of genetically modified DP23211 maize for corn rootworm control. *GM crops & food* 11, 206-214. 10.1080/21645698.2020.1770556
- Boonchaisri S, Rochfort S, Stevenson T and Dias DA, **2021**. LC-MS untargeted metabolomics assesses the delayed response of glufosinate treatment of transgenic glufosinate resistant (GR) buffalo grasses (*Stenotaphrum secundatum* L.). *Metabolomics : Official journal of the Metabolomic Society* 17, 28. 10.1007/s11306-021-01776-5
- Borges MPdS, Silva DV, Souza MdF, Silva TS, Teofilo TMdS, da Silva CC, Pavao QS, Passos ABRdJ and Dos Santos JB, **2021**. Glyphosate effects on tree species natives from Cerrado and Caatinga Brazilian biome: Assessing sensitivity to two ways of contamination. *The Science of the total environment* 769, 144113. 10.1016/j.scitotenv.2020.144113
- Carlson AB, Mukerji P, Mathesius CA, Huang E, Herman RA, Hoban D, Thurman JD and Roper JM, **2020**. DP-202216-6 maize does not adversely affect rats in a 90-day feeding study. *Regulatory toxicology and pharmacology : RTP* 117, 104779. 10.1016/j.yrtph.2020.104779
- Cicchillo RM, Beeson WT, McCaskill DG, Shan G, Herman RA and Walsh TA, **2020**. Identification of iron-chelating phenolics contributing to seed coat coloration in soybeans (*Glycine max* (L.) Merr.) expressing aryloxyalkanoate dioxygenase-12. *Phytochemistry* 172, 112279. 10.1016/j.phytochem.2020.112279
- Du Y, Chen F, Chen C and Liu K, **2020**. Monitoring and traceability of genetically modified soya bean event GTS 40-3-2 during soya bean protein concentrate and isolate preparation. *Royal Society Open Science* 7, 201147. 10.1098/rsos.201147
- Farias ME, Marani MM, Ramirez D, Niebylski AM, Correa NM and Molina PG, **2020**. Polyclonal antibody production anti Pc_312-324 peptide. Its potential use in electrochemical immunosensors for transgenic soybean detection. *Bioelectrochemistry (Amsterdam, Netherlands)* 131, 107397.

- 10.1016/j.bioelechem.2019.107397
- Finley JW and Duke SO, **2020**. Agnes Rimando, a Pioneer in the Fate of Glyphosate and Its Primary Metabolite in Plants. *Journal of Agricultural and Food Chemistry* 68, 5623-5630. 10.1021/acs.jafc.0c00811
- Griffin SL, Chekan JR, Lira JM, Robinson AE, Yerkes CN, Siehl DL, Wright TR, Nair SK and Cicchillo RM, **2021**. Characterization of a Glyphosate-Tolerant Enzyme from *Streptomyces svecius*: A Distinct Class of 5-Enolpyruvylshikimate-3-phosphate Synthases. *Journal of Agricultural and Food Chemistry* 69, 5096-5104. 10.1021/acs.jafc.1c00439
- Hu Y, Guo M, Zhuo Q, Han C, Shi L, Mao H, Li Y, Zhao J, Chen C and Yang X, **2020**. Three-Generation Reproductive Toxicity of Genetically Modified Maize with Cry1Ab and epsps Genes in Rats. *Journal of Agricultural and Food Chemistry* 68, 10912-10919. 10.1021/acs.jafc.0c02237
- Karthik K, Nandiganti M, Thangaraj A, Singh S, Mishra P, Rathinam M, Sharma M, Singh NK, Dash PK and Sreevathsa R, **2020**. Transgenic Cotton (*Gossypium hirsutum* L.) to Combat Weed Vagaries: Utility of an Apical Meristem-Targeted in planta Transformation Strategy to Introgress a Modified CP4-EPSPS Gene for Glyphosate Tolerance. *Frontiers in Plant Science* 11, 768. 10.3389/fpls.2020.00768
- Liu JY, Sheng ZW, Hu YQ, Liu Q, Qiang S, Song XL and Liu B, **2021**. Fitness of F1 hybrids between 10 maternal wild soybean populations and transgenic soybean. *Transgenic Research* 30, 105-119. 10.1007/s11248-020-00230-x
- Luan H, Liao W, Song Y, Niu H, Hu T and Zhi H, **2020**. Transgenic plant generated by RNAi-mediated knocking down of soybean Vma12 and soybean mosaic virus resistance evaluation. *AMB Express* 10, 62. 10.1186/s13568-020-00997-6
- Machado EP, Dos S Rodrigues Junior GL, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Cross-crop resistance of *Spodoptera frugiperda* selected on Bt maize to genetically-modified soybean expressing Cry1Ac and Cry1F proteins in Brazil. *Scientific Reports* 10, 10080. 10.1038/s41598-020-67339-1
- Machado EP, Dos S Rodrigues Junior GL, Somavilla JC, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Survival and development of *Spodoptera eridania*, *Spodoptera cosmioides* and *Spodoptera albula* (Lepidoptera: Noctuidae) on genetically-modified soybean expressing Cry1Ac and Cry1F proteins. *Pest Management Science* 76, 4029-4035. 10.1002/ps.5955
- Moraes JS, da Silva Nornberg BF, Castro MRd, Vaz BDS, Mizuschima CW, Marins LFF and Martins CdMG, **2020**. Zebrafish (*Danio rerio*) ability to activate ABCC transporters after exposure to glyphosate and its formulation Roundup Transorb. *Chemosphere* 248, 125959. 10.1016/j.chemosphere.2020.125959
- Naegeli H, Bresson J-L, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Sanchez Serrano JJ, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, De Sanctis G, Devos Y, Dumont AF, Federici S, Gennaro A, Gomez Ruiz JA, Lanzoni A, Neri FM, Papadopoulou N, Paraskevopoulos K, Raffaello T and Organisms EPoGM, **2020**. Scientific Opinion on application EFSA-GMO-NL-2016-132 for authorisation of genetically modified of insect-resistant and herbicide-tolerant soybean DAS-81419-2**DAS-44406-6* for food and feed uses, import and processing submitted in accordance with Regulation (EC) No 1829/2003 by DowAgrosciencesLCC. EFSA journal European Food Safety Authority 18, e06302. 10.2903/j.efsa.2020.6302
- Pan L, Yu Q, Wang J, Han H, Mao L, Nyporko A, Maguza A, Fan L, Bai L and Powles S, **2021**. An ABCC-type transporter endowing glyphosate resistance in plants.

- Proceedings of the National Academy of Sciences of the United States of America 118. 10.1073/pnas.2100136118
- Pareddy D, Chennareddy S, Anthony G, Sardesai N, Mall T, Minnicks T, Karpova O, Clark L, Griffin D, Bishop B, Shumway N, Samuel P, Smith K and Sarria R, **2020**. Improved soybean transformation for efficient and high throughput transgenic production. *Transgenic Research* 29, 267-281. 10.1007/s11248-020-00198-8
- Silva JB, Mori R, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Bing J, Gratao PL and Rossi GD, **2021**. Water Deprivation Induces Biochemical Changes Without Reduction in the Insecticidal Activity of Maize and Soybean Transgenic Plants. *Journal of Economic Entomology*. 10.1093/jee/toab109
- Soga K, Kimata S, Narushima J, Sato S, Sato E, Mano J, Takabatake R, Kitta K, Kawakami H, Akiyama H, Kondo K and Nakamura K, **2020**. Development and Testing of an Individual Kernel Detection System for Genetically Modified Soybean Events in Non-identity-preserved Soybean Samples. *Biological & Pharmaceutical Bulletin* 43, 1259-1266. 10.1248/bpb.b20-00382
- Swatkoski SJ and Croley TR, **2020**. Screening of Processed Foods for Transgenic Proteins from Genetically Engineered Plants Using Targeted Mass Spectrometry. *Analytical Chemistry* 92, 3455-3462. 10.1021/acs.analchem.9b05577
- Wheeler TA, Siders K, Monclova-Santana C and Dever JK, **2020**. The relationship between commercial cotton cultivars with varying *Meloidogyne incognita* resistance genes and yield. *Journal of nematology* 52, 1-8. 10.21307/jofnem-2020-064
- Xu J, Wan C, Luan S, Li X, Xu Y, Zhao YU and Cao J, **2021**. Applicability of plasmid calibrant pMON87712 for quantitative detection of the transgenic soybean MON87712. *Acta biochimica et biophysica Sinica* 53, 933-942. 10.1093/abbs/gmab063
- Yang L, Guo M, Han C, Li Y, Mao H, Zhao J, Chen C, Shi L and Zhuo Q, **2020**. Immune function effect of F3 rats fed with genetically modified maize harboring Cry1Ab and epsps genes. *Wei sheng yan jiu = Journal of hygiene research* 49, 569-573. 10.19813/j.cnki.weishengyanjiu.2020.04.008
- Yang M, Wen Z, Fazal A, Hua X, Xu X, Yin T, Qi J, Yang R, Lu G, Hong Z and Yang Y, **2020**. Impact of a G2-EPSPS & GAT Dual Transgenic Glyphosate-Resistant Soybean Line on the Soil Microbial Community under Field Conditions Affected by Glyphosate Application. *Microbes and Environments* 35. 10.1264/jsme2.ME20056
- Ye Z, Wu F and Hennessy DA, **2021**. Environmental and economic concerns surrounding restrictions on glyphosate use in corn. *Proceedings of the National Academy of Sciences of the United States of America* 118. 10.1073/pnas.2017470118
- Yook M-J, Park H-R, Zhang C-J, Lim S-H, Jeong S-C, Chung YS and Kim D-S, **2021**. Environmental risk assessment of glufosinate-resistant soybean by pollen-mediated gene flow under field conditions in the region of the genetic origin. *The Science of the total environment* 762, 143073. 10.1016/j.scitotenv.2020.143073
- Zeng H, Wang J, Jia J, Wu G, Yang Q, Liu X and Tang X, **2021**. Development of a lateral flow test strip for simultaneous detection of BT-Cry1Ab, BT-Cry1Ac and CP4 EPSPS proteins in genetically modified crops. *Food Chemistry* 335, 127627. 10.1016/j.foodchem.2020.127627
- Zeng H, Yang Q, Liu H, Wu G, Jiang W, Liu X, Wang J and Tang X, **2021**. A sensitive immunosensor based on graphene-PAMAM composites for rapid detection of the CP4-EPSPS protein in genetically modified crops. *Food Chemistry* 361, 129901. 10.1016/j.foodchem.2021.129901
- Zhai R, Ye S, Zhu G, Lu Y, Ye J, Yu F, Chu Q and Zhang X, **2020**. Identification and

integrated analysis of glyphosate stress-responsive microRNAs, lncRNAs, and mRNAs in rice using genome-wide high-throughput sequencing. *BMC Genomics* 21, 238. 10.1186/s12864-020-6637-6

Zhang L, Li S-F, Zhou Q-H, Liu Y-H, Zhang J and Qian Z-Y, **2021**. Subchronic toxicity study in rats evaluating herbicide-tolerant soybean DAS-68416-4. *Regulatory toxicology and pharmacology* : RTP 119, 104833. 10.1016/j.yrtph.2020.104833

Zhang L, Shen W, Fang Z and Liu B, **2021**. Effects of genetically modified maize expressing Cry1Ab and EPSPS proteins on Japanese quail. *Poultry Science* 100, 1068-1075. 10.1016/j.psj.2020.11.014

4. Entries retrieved using Europe PMC

Broothaerts W, Cordeiro F, Robouch P and Emons H, **2020**. Ten years of proficiency testing reveals an improvement in the analytical performance of EU National Reference Laboratories for genetically modified food and feed. *Food Control* 114, 107237. 10.1016/j.foodcont.2020.107237

Cicchillo RM, Beeson WT, McCaskill DG, Shan G, Herman RA and Walsh TA, **2020**. Identification of iron-chelating phenolics contributing to seed coat coloration in soybeans (*Glycine max* (L.) Merr.) expressing aryloxyalkanoate dioxygenase-12. *Phytochemistry* 172, 112279. 10.1016/j.phytochem.2020.112279

Machado EP, Dos S Rodrigues Junior GL, Führ FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Cross-crop resistance of *Spodoptera frugiperda* selected on Bt maize to genetically-modified soybean expressing Cry1Ac and Cry1F proteins in Brazil. In: *Scientific Reports*. p 10080. ^10.1038/s41598-020-67339-1

Machado EP, Dos S Rodrigues Junior GL, Somavilla JC, Führ FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, **2020**. Survival and development of *Spodoptera eridania*, *Spodoptera cosmioides* and *Spodoptera albula* (Lepidoptera: Noctuidae) on genetically-modified soybean expressing Cry1Ac and Cry1F proteins. *Pest Management Science* 76, 4029-4035. 10.1002/ps.5955

Matsushita A, Goto H, Takahashi Y, Tsuda M and Ohsawa R, **2020**. Consideration of familiarity accumulated in the confined field trials for environmental risk assessment of genetically modified soybean (*Glycine max*) in Japan. *Transgenic Research* 29, 229-242. 10.1007/s11248-020-00193-z

Organisms EPoGM, Naegeli H, Bresson J-L, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogué F, Rostoks N, Sánchez Serrano JJ, Savoini G, Veromann E, Veronesi F, Álvarez F, Ardizzone M, De Sanctis G, Devos Y, Dumont AF, Federici S, Gennaro A, Gómez Ruiz JÁ, Lanzoni A, Neri FM, Papadopoulou N, Paraskevopoulos K and Raffaello T, **2020**. Scientific Opinion on application EFSA-GMO-NL-2016-132 for authorisation of genetically modified of insect-resistant and herbicide-tolerant soybean DAS-81419-2 × DAS-44406-6 for food and feed uses, import and processing submitted in accordance with Regulation (EC) No 1829/2003 by Dow Agrosiences LCC. In: *EFSA journal European Food Safety Authority*. p e06302. ^10.2903/j.efsa.2020.6302

Park S-B, Kim J-Y, Lee D-G, Kim J-H, Shin M-K and Kim H-Y, **2021**. Development of a Systematic qPCR Array for Screening GM Soybeans. In: *Foods* (Basel, Switzerland). ^10.3390/foods10030610

Silva JB, Mori R, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Bing J, Grato PL and Rossi GD, **2021**. Water Deprivation Induces Biochemical Changes Without Reduction in the Insecticidal Activity of Maize and Soybean Transgenic Plants. *Journal of Economic Entomology*. 10.1093/jee/toab109

Verginelli D, Paternò A, De Marchis ML, Quarchioni C, Vinciguerra D, Bonini P, Peddis

S, Fusco C, Misto M, Marfoggia C, Pomilio F and Marchesi U, **2020**. Development and comparative study of a pat/bar real-time PCR assay for integrating the screening strategy of a GMO testing laboratory. *Journal of the Science of Food and Agriculture* 100, 2121-2129. 10.1002/jsfa.10235

5. Entries retrieved using reference lists of opinions of regulatory bodies and screened on full text

None

6. New entries retrieved using all search strategies (excluding duplicates and studies retrieved by the previous search conducted in 2019)

Achary VMM, Sheri V, Manna M, Panditi V, Borphukan B, Ram B, Agarwal A, Fartyal D, Teotia D, Masakapalli SK, Agrawal PK and Reddy MK, **2020**. Overexpression of improved EPSPS gene results in field level glyphosate tolerance and higher grain yield in rice. *Plant biotechnology journal* 18, 2504-2519. 10.1111/pbi.13428

Albrecht AJP, de Brito I, Albrecht LP, Silva AFM, de Matos AKA, Carbonari CA and Velini ED, **2020**. Metabolic changes, agronomic performance, and quality of seeds in soybean with the pat gene after application of glufosinate. *Weed Science* 68, 594-604. 10.1017/wsc.2020.74

Ali L, Jo H, Song JT and Lee JD, **2020**. The Prospect of Bentazone-Tolerant Soybean for Conventional Cultivation. *Agronomy-Basel* 10, 16. 10.3390/agronomy10111650

Almeida MF, Tavares CS, Araujo EO, Picanco MC, Oliveira EE and Pereira EJG, **2021**. Plant Resistance in Some Modern Soybean Varieties May Favor Population Growth and Modify the Stylet Penetration of *Bemisia tabaci* (Hemiptera: Aleyrodidae). *Journal of Economic Entomology* 114, 970-978. 10.1093/jee/toab008

Basavaraju SN, Lakshmikanth RY and Udayakumar M, **2020**. A modified in-planta transformation technique to generate stable gain-in function transformants in a recalcitrant indica rice genotype. *Plant Physiology Reports* 25, 231-244. 10.1007/s40502-020-00517-5

Biazoto FS, Albrecht LP, Albrecht AJP, Silva AFM, Pereira VGC, Mundt TT, Baccin LC, Mattiuzzi MD and Pertuzati A, **2020**. AGRONOMIC PERFORMANCE AND CHLOROPHYLL INDICES OF TRANSGENIC SOYBEAN (with *csr1-2* gene), UNDER IMAZAPIC/IMAZAPYR POST APPLICATION. *Pakistan Journal of Agricultural Sciences* 57, 1223-1229. 10.21162/pakjas/20.9821

Boonchaisri S, Rochfort S, Stevenson T and Dias DA, **2021**. LC-MS untargeted metabolomics assesses the delayed response of glufosinate treatment of transgenic glufosinate resistant (GR) buffalo grasses (*Stenotaphrum secundatum* L.). *Metabolomics* 17, 17. 10.1007/s11306-021-01776-5

Borges MPdS, Silva DV, Souza MdF, Silva TS, Teofilo TMdS, da Silva CC, Pavao QS, Passos ABRdJ and Dos Santos JB, **2021**. Glyphosate effects on tree species natives from Cerrado and Caatinga Brazilian biome: Assessing sensitivity to two ways of contamination. *The Science of the total environment* 769, 144113. 10.1016/j.scitotenv.2020.144113

Carvalho SJPd, Picoli Junior GJ and Ovejero RFL, **2020**. Chemical control of soybean and cotton volunteer plants resistant to dicamba

Controle químico de plantas voluntárias de soja e algodão tolerantes a dicamba. *Revista Brasileira de Herbicidas* 19. 10.7824/rbh.v19i2.695

Chen P, Shannon G, Ali ML, Scaboo A, Crisel M, Smothers S, Clubb M, Selves S, Vieira CC, Mitchum MG, Nguyen HT, Li Z, Bond J, Meinhardt C, Usovsky M, Li S, Mengistu A and Robbins RT, **2020**. Registration of 'S14-9017GT' soybean cultivar with high yield, resistance to multiple diseases, and high seed oil content. *Journal of*

- Plant Registrations 14, 347-356. 10.1002/plr2.20011
- Chen Y, Liu L, Guan X and Liu B, **2020**. Impact of transgenic herbicide-resistant soybean on the diversity of arthropods and weeds in soybean fields. *Acta Entomologica Sinica* 63, 1366-1376. 10.16380/j.kcxb.2020.11.009
- da Costa LF, Tormena CF and Arruda MAZ, **2021**. Ionomics and lipidomics for evaluating the transgenic (cp4-EPSPS gene) and non-transgenic soybean seed generations. *Microchemical Journal* 165, 8. 10.1016/j.microc.2021.106130
- Du Y, Chen FS, Chen C and Liu KL, **2020**. Monitoring and traceability of genetically modified soya bean event GTS 40-3-2 during soya bean protein concentrate and isolate preparation. *Royal Society Open Science* 7, 12. 10.1098/rsos.201147
- Du Y, Chen FS, Bu GH and Zhang LF, **2021**. Distribution and degradation of DNA from non-genetically and genetically modified soybean (Roundup Ready): Impact of soybean protein concentrate and soybean protein isolate preparation. *Food Chemistry* 335, 9. 10.1016/j.foodchem.2020.127582
- Farias ME, Marani MM, Ramirez D, Niebylski AM, Correa NM and Molina PG, **2020**. Polyclonal antibody production anti Pc₃₁₂₋₃₂₄ peptide. Its potential use in electrochemical immunosensors for transgenic soybean detection. *Bioelectrochemistry* 131, 8. 10.1016/j.bioelechem.2019.107397
- Garcia JR, Vargas AAM, Perboni LT, Souza EA, Tessaro D, Lucio FR and Agostinetto D, **2020**. Physiological attributes of Enlist E3 (TM) soybean seed submitted to herbicides application. *Planta Daninha* 38, 6. 10.1590/s0100-83582020380100088
- Griffin SL, Chekan JR, Lira JM, Robinson AE, Yerkes CN, Siehl DL, Wright TR, Nair SK and Cicchillo RM, **2021**. Characterization of a Glyphosate-Tolerant Enzyme from *Streptomyces svecius*: A Distinct Class of 5-Enolpyruvylshikimate-3-phosphate Synthases. *Journal of Agricultural and Food Chemistry* 69, 5096-5104. 10.1021/acs.jafc.1c00439
- Gruber K, Courteau B, Bokhoree M, McMahon E, Kotz J and Nienow A, **2021**. Photolysis of the herbicide dicamba in aqueous solutions and on corn (*Zea mays*) epicuticular waxes. *Environmental Science-Processes & Impacts* 23, 786-802. 10.1039/d1em00058f
- Hill ZT, Barber LT, Doherty RC, Collie LM and Ross A, **2020**. Prickly sida and grass species control in xtend and enlist soybean systems. *BR Wells Rice Research Studies - Arkansas Agricultural Experiment Station, University of Arkansas System* 159-161.
- Hu Y, Guo M, Zhuo Q, Han C, Shi L, Mao H, Li Y, Zhao J, Chen C and Yang X, **2020**. Three-Generation Reproductive Toxicity of Genetically Modified Maize with Cry1Ab and epsps Genes in Rats. *Journal of Agricultural and Food Chemistry* 68, 10912-10919. 10.1021/acs.jafc.0c02237
- Jamshidnia M, Kazemitabar SK, Lindermayr C and Zarini HN, **2020**. Transformation of *Nicotiana tabacum* using the herbicide resistance bar gene as a selectable marker. *Acta Horticulturae* 455-461. 10.17660/ActaHortic.2020.1297.60
- Jhala AJ, Beckie HJ, Peters TJ, Culpepper AS and Norsworthy JK, **2021**. Interference and management of herbicide-resistant crop volunteers. *Weed Science* 69, 257-273. 10.1017/wsc.2021.3
- Jing W, Yong G and Lijuan Q, **2020**. Establishment and application of multiple PCR detection system for glyphosate-tolerant gene EPSPS/GAT in soybean. *Scientia Agricultura Sinica* 53, 4127-4136. 10.3864/j.issn.0578-1752.2020.20.003
- Liu JY, Sheng ZW, Hu YQ, Liu Q, Qiang S, Song XL and Liu B, **2021**. Fitness of F1 hybrids between 10 maternal wild soybean populations and transgenic soybean. *Transgenic Research* 30, 105-119. 10.1007/s11248-020-00230-x

- Liu WX, Zhao HM, Miao CH and Jin WJ, **2021**. Integrated proteomics and metabolomics analysis of transgenic and gene-stacked maize line seeds. *Gm Crops & Food-Biotechnology in Agriculture and the Food Chain* 12, 361-375. 10.1080/21645698.2021.1934351
- Masotti F, Garavaglia BS, Piazza A, Burdisso P, Altabe S, Gottig N and Ottado J, **2021**. Bacterial isolates from Argentine Pampas and their ability to degrade glyphosate. *Science of the Total Environment* 774, 12. 10.1016/j.scitotenv.2021.145761
- Mbatyoti A, De Beer A, Daneel MS, Swart A, Marais M, De Waele D and Fourie H, **2021**. The host status of glyphosate-tolerant soybean genotypes to *Meloidogyne incognita* and *Pratylenchus* infection. *Tropical Plant Pathology* 46, 336-349. 10.1007/s40858-020-00416-y
- McCormick AN, Smith LG, Dillon TW, Collie LM, Davis BM and Butts TR, **2020**. Nozzle type effect on coverage and canopy penetration using enlist one and liberty in enlist e3 soybean. *BR Wells Rice Research Studies - Arkansas Agricultural Experiment Station, University of Arkansas System* 140-145.
- Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, De Sanctis G, Devos Y, Dumont AF, Federici S, Gennaro A, Ruiz JAG, Lanzoni A, Neri FM, Papadopoulou N, Paraskevopoulos K, Raffaello T and Modified EPG, **2020**. Scientific Opinion on application EFSA-GMO-NL-2016-132 for authorisation of genetically modified of insect-resistant and herbicide-tolerant soybean DAS-81419-2 x DAS-44406-6 for food and feed uses, import and processing submitted in accordance with Regulation (EC) No 1829/2003 by Dow Agrosciences LCC. *Efsa Journal* 18, 37. 10.2903/j.efsa.2020.6302
- Oh S, Park S, Lee S, Yun D, Lee G and Suh S, **2020**. Influence of vitamin A-enhanced transgenic soybean cultivation on the diversity of insects in LMO quarantine fields. *Korean Journal of Breeding Science* 52, 310-321. 10.9787/kjbs.2020.52.4.310
- Pan L, Yu Q, Wang JZ, Han HP, Mao LF, Nyporko A, Maguza A, Fan LJ, Bai LY and Powles S, **2021**. An ABCC-type transporter endowing glyphosate resistance in plants. *Proceedings of the National Academy of Sciences of the United States of America* 118, 11. 10.1073/pnas.2100136118
- Park S-B, Kim J-Y, Lee D-G, Kim J-H, Shin M-K and Kim H-Y, **2021**. Development of a Systematic qPCR Array for Screening GM Soybeans. In: *Foods* (Basel, Switzerland). ^10.3390/foods10030610
- Pavlovic S, Savic J, Milojevic J, Vinterhalter B, Girek Z, Adzic S, Zecevic B and Banjac N, **2020**. Introduction of the nicotiana protein kinase (NPK1) gene by combining *Agrobacterium*-mediated transformation and recurrent somatic embryogenesis to enhance salt tolerance in cauliflower. *Plant Cell, Tissue and Organ Culture* 143, 635-651. 10.1007/s11240-020-01948-6
- Piccini C, Fazi S, Perez G, Batani G, de la Escalera GM and Sotelo-Silveira JR, **2020**. Resistance to degradation and effect of the herbicide glyphosate on the bacterioplankton community of a large river system dominated by agricultural activities. *Marine and Freshwater Research* 71, 1026-1032. 10.1071/mf19079
- Qian BJ, Huang L, Zhao J and Zhu J, **2021**. Analysis of physiochemical composition and antioxidant properties between hulls of the genetically modified glyphosate-tolerant soybean and northeast soybean. *Food Science and Biotechnology* 30, 505-512. 10.1007/s10068-021-00894-z
- Rodrigues NR, de Souza APF, Morais PPP, Braga DPV, Crivellari AC, Favoretto LRG and Berger GU, **2021**. Residues of glyphosate and aminomethylphosphonic acid

- (AMPA) in genetically modified glyphosate tolerant soybean, corn and cotton crops. *Ciencia Rural* 51, 13. 10.1590/0103-8478cr20190244
- Samples CA, Kruger GR, Dodds DM, Irby JT, Reynolds DB and Catchot AL, **2021**. Injury Potential from Herbicide Combinations in Enlist (R) Cotton. *Journal of Cotton Science* 25, 51-57.
- Seok J, Kim YJ, Kim IK and Kim KJ, **2020**. Structural basis for stereospecificity to D-amino acid of glycine oxidase from *Bacillus cereus* ATCC 14579. *Biochemical and Biophysical Research Communications* 533, 824-830. 10.1016/j.bbrc.2020.09.093
- Shyam C, Chahal PS, Jhala AJ and Jugulam M, **2021**. Management of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in 2,4-D-, glufosinate-, and glyphosate-resistant soybean. *Weed Technology* 35, 136-143. 10.1017/wet.2020.91
- Silva JB, Mori R, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Bing J, Gratao PL and Rossi GD, **2021**. Water Deprivation Induces Biochemical Changes Without Reduction in the Insecticidal Activity of Maize and Soybean Transgenic Plants. *Journal of Economic Entomology*. 10.1093/jee/toab109
- Takahashi GO, Braz GBP, Machado FG, Barroso ALdL and Solino AJdS, **2020**. Control of voluntary soybean plants with herbicides recommended for cotton
- Controle de soja voluntaria com herbicidas registrados para algodoeiro. *Revista Brasileira de Herbicidas* 19. 10.7824/rbh.v19i4.707
- Tauhata SBF, Araujo GBd, Oliveira Alves SDFd, Martins DNV, Lopes LS and Casaletti L, **2020**. The glyphosate controversy: an update. *Arquivos do Instituto Biologico (Sao Paulo)* 87. 10.1590/1808-1657001002018
- Xu J, Wan C, Luan S, Li X, Xu Y, Zhao YU and Cao J, **2021**. Applicability of plasmid calibrant pMON87712 for quantitative detection of the transgenic soybean MON87712. *Acta biochimica et biophysica Sinica* 53, 933-942. 10.1093/abbs/gmab063
- Yang MK, Wen ZL, Fazal A, Hua XM, Xu XH, Yin TM, Qi JL, Yang RW, Lu GH, Hong Z and Yang YH, **2020**. Impact of a G2-EPSPS & GAT Dual Transgenic Glyphosate-Resistant Soybean Line on the Soil Microbial Community under Field Conditions Affected by Glyphosate Application. *Microbes and Environments* 35, 10. 10.1264/jsme2.ME20056
- Ye ZW, Wu F and Hennessy DA, **2021**. Environmental and economic concerns surrounding restrictions on glyphosate use in corn. *Proceedings of the National Academy of Sciences of the United States of America* 118, 9. 10.1073/pnas.2017470118
- Yook MJ, Park HR, Zhang CJ, Lim SH, Jeong SC, Chung YS and Kim DS, **2021**. Environmental risk assessment of glufosinate-resistant soybean by pollen-mediated gene flow under field conditions in the region of the genetic origin. *Science of the Total Environment* 762, 11. 10.1016/j.scitotenv.2020.143073
- Yu H, Jia F, Quan Z, Cui H, Li X, Huilin Y, Fang J, Zonghua Q, Hailan C and Xiangju L, **2020**. Effects of glyphosate on weed control, soybean safety and weed occurrence in transgenic herbicide-resistant soybean. *Scientia Agricultura Sinica* 53, 1166-1177. 10.3864/j.issn.0578-1752.2020.06.008
- Zeng H, Yang Q, Liu H, Wu G, Jiang W, Liu X, Wang J and Tang X, **2021**. A sensitive immunosensor based on graphene-PAMAM composites for rapid detection of the CP4-EPSPS protein in genetically modified crops. *Food Chemistry* 361, 129901. 10.1016/j.foodchem.2021.129901
- Zhai R, Ye S, Zhu G, Lu Y, Ye J, Yu F, Chu Q and Zhang X, **2020**. Identification and integrated analysis of glyphosate stress-responsive microRNAs, lncRNAs, and mRNAs in rice using genome-wide high-throughput sequencing. *BMC genomics* 21, 238. 10.1186/s12864-020-6637-6

-
- Zhang L, Li SF, Zhou QH, Liu YH, Zhang J and Qian ZY, **2021**. Subchronic toxicity study in rats evaluating herbicide-tolerant soybean DAS-68416-4. *Regulatory Toxicology and Pharmacology* 119, 8. 10.1016/j.yrtph.2020.104833
- Zhang L, Shen WJ, Fang ZX and Liu B, **2021**. Effects of genetically modified maize expressing Cry1Ab and EPSPS proteins on Japanese quail. *Poultry Science* 100, 1068-1075. 10.1016/j.psj.2020.11.014

Appendix 4. Publications screened for relevance based on the full text

Table 4.1. Report of all relevant publications retrieved after detailed assessment of full-text documents for relevance

Category of information/ data requirement(s)	Reference (Author, year, title, source)
None	Not applicable

Table 4.2. Report of publications excluded from the risk assessment after detailed assessment of full-text documents

Reference (Author, year, title, source)	Reason(s) for exclusion based on eligibility/inclusion criteria
Garcia JR, Vargas AAM, Perboni LT, Souza EA, Tessaro D, Lucio FR and Agostinetto D, 2020. Physiological attributes of Enlist E3 (TM) soybean seed submitted to herbicides application. <i>Planta Daninha</i> 38, 6.	Comparator: no Non-GM control
Naegeli H, Bresson JL, Dalmay T, Dewhurst IC, Epstein MM, Firbank LG, Guerche P, Hejatko J, Moreno FJ, Mullins E, Nogue F, Rostoks N, Serrano JJS, Savoini G, Veromann E, Veronesi F, Alvarez F, Ardizzone M, De Sanctis G, Devos Y, Dumont AF, Federici S, Gennaro A, Ruiz JAG, Lanzoni A, Neri FM, Papadopoulou N, Paraskevopoulos K, Raffaello T and Modified EPG, 2020. Scientific Opinion on application EFSA-GMO-NL-2016-132 for authorisation of genetically modified of insect-resistant and herbicide-tolerant soybean DAS-81419-2 x DAS-44406-6 for food and feed uses, import and processing submitted in accordance with Regulation (EC) No 1829/2003 by Dow Agrosciences LCC. <i>Efsa Journal</i> 18, 37.	Reporting format (not a primary research study); Intervention/exposure (not on DAS-44406-6 single)
Silva JB, Mori R, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Bing J, Gratao PL and Rossi GD, 2021. Water Deprivation Induces Biochemical Changes Without Reduction in the Insecticidal Activity of Maize and Soybean Transgenic Plants. <i>Journal of Economic Entomology</i> .	Intervention/exposure (not on DAS-44406-6 single); Outcome
Zhang L, Li SF, Zhou QH, Liu YH, Zhang J and Qian ZY, 2021. Subchronic toxicity study in rats evaluating herbicide-tolerant soybean DAS-68416-4. <i>Regulatory Toxicology and Pharmacology</i> 119, 8.	Intervention/exposure (not on DAS-44406-6)

Table 4.3. Report of unobtainable/unclear publications

Reference (Author, year, title, source)	Description of (unsuccessful) methods used to try to obtain a copy of the publication
None	Not applicable