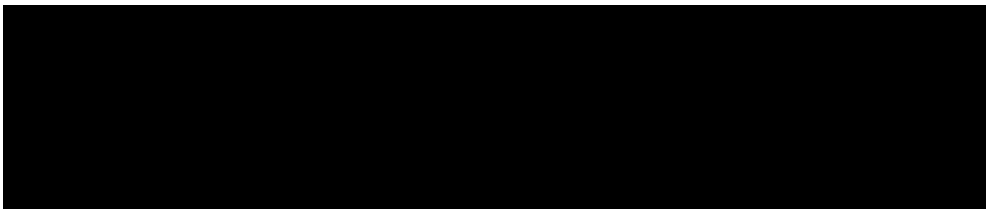
Review of literature for 281-24-236 x 3006-210-23 and 281-24-236 x 3006-210-23 x MON 88913 cotton in the scope of their authorisations for food and feed uses, import and processing in the EU (2020 update)



PHI-R104-Y20

Table of contents

1. Summary

An updated systematic search of peer-reviewed literature in line with the EFSA Guidance on conducting a systematic review (EFSA, 2010) and taking into account the explanatory note on literature searching conducted in the context of GMO applications (EFSA, 2019), was conducted with the following review question "Does 281-24-236 x 3006-210-23 cotton or 281-24-236 x 3006-210-23 x MON 88913 cotton and derived food/feed products, or the intended traits (the newly expressed proteins or their combination) have adverse effects on human and animal health and the environment in the scope of their authorisation?",

The current systematic search complements the searches previously performed in 2019. 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 new publications relevant for the review question were identified during the selected time period. No safety concerns were identified for 281-24-236 x 3006-210-23 or 281-24-236 x 3006-210-23 x MON 88913 cotton 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 (2019) is still relevant and no updates were identified.

3. Results of the Scoping Exercise

3.1. Outcome of literature searches

In October 2020, 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 2. Documenting and reporting the search process

Resources	Date of search	Period searched	Other restrictions	Number of records retrieved
Web of Science Core collection[#$]	7 Oct 2020	2019-7 Oct 2020	None	274
CAB Abstracts[#$]	7 Oct 2020	2019-7 Oct 2020	None	134
MEDLINE[#$]	7 Oct 2020	2019-7 Oct 2020	None	154
Europe PMC[#$]	7 Oct 2020	2019-7 Oct 2020	None	4
Screening reference lists	7 Oct 2020	-	2019-7 Oct 2020[§]	0 **

[#] A justification for chosing these databases was provided in Section 2.2 of the previous literature search report (2019). The combination of these sources allows having a broad coverage of publications related to GMO risk assessment.

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

§ The time period was applied post-hoc.

** Number of records screened on full text.

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 the 281-24-236 x 3006-210-23 x MON 88913 or 281-24-236 x 3006-210-23 cotton nor any reviews 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 2019 annual monitoring report were also removed (see Appendix 3, Section 6).

The results of the publication selection process are presented in Table 3.

Table 3. Results of the publication selection process, for the review question

Review question: "Do the authorised cotton events[1] and derived food/feed products, or the intended traits (the newly expressed protein(s) or their combination), have adverse effects on human and animal health and the environment in the scope of their applications?"	**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 2019 monitoring reports)	158
Number of publications excluded from the search results after rapid assessment for relevance based on title and abstract	156
Total number of full-text documents assessed in detail	2
Number of publications excluded from further consideration after detailed assessment for relevance based on full text	2
Total number of unobtainable/unclear publications	0
Total number of relevant publications	0

The 158 unique entries present in the Endnote database (Table 3) were manually screened for relevance to the review question by two independent reviewers using the a priori eligibility/inclusion criteria described in Appendix 2.

Entries that are deemed to be irrelevant based on title/abstract were not further retained. In cases where 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 (as listed in Appendix 4). The reason for excluding a result from the second screening is documented and a justification for not further assessing a reference is provided in Table 4.2 in Appendix 4.

No publications were considered relevant (see Appendix 4, Table 4.1). No unobtainable/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 the 281-24-236 x 3006-210-23 or 281-24-236 x 3006-210-23 x MON

[1] Authorised cotton events include 281-24-236 x 3006-210-23 and 281-24-236 x 3006-210-23 x MON 88913

88913 cotton within the scope of the authorisations for the defined time period. No safety concerns have been identified for the authorised cotton by this literature search exercise.

References

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 authorised cotton events

Web of Science Core collection

Set	Search query
Event #1	TS=(DAS24236* OR DAS-24236 OR DAS-24236-5 OR 281-24-236 OR DAS21023* OR DAS-21023 OR DAS-21Ø23-5 OR DAS-21-circle-divide-23-5 OR DAS-21empty set23-5 OR 3006-210-23 OR 281-24-236x3006-210-23 OR DAS-24236-5xDAS-21Ø23-5 OR DAS-24236-5xDAS-21-circle-divide-23-5 OR DAS-24236-5xDAS-21empty-set23-5 OR *281x3006* OR WideStrike* OR MXB-13)
Stack #2	TS=(DAS-24236-5xDAS-21Ø23-5xMON-88913-8 OR DAS-24236-5xDAS-21-circle-divide-23-5xMON-88913-8 OR DAS-24236-5xDAS-21empty-set23-5xMON-88913-8 OR 281-24-236x3006-210-23xMON88913 OR *281x3006x88913* OR *281x3006xMON*)
#3	#1 OR #2
Proteins #4	TS=((cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR cry1Ac OR Cry1-Ac OR cry1a-c OR cryiAc OR Cryi-Ac OR cryia-c OR (cry AND (1Ac or 1-Ac or iAc or i-Ac))) AND (Streptomyces OR viridochromogenes OR Bacillus OR thuringiensis OR bt OR cotton OR gossypium OR hirsutum 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 OR stack))
Traits #5	TS=((lepidopter* OR bollworm* OR pectinophora OR gossypiella OR corn-earworm* OR sorghum-headworm* OR helicoverpa OR armigera OR tobacco-budworm* OR heliothis OR virescens OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*)) AND (toler* OR resist* OR protec*) AND (cotton OR gossypium OR hirsutum) 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* OR stack))))
#6	#3 OR #4 OR #5
Reporting Period #7	PY=(2019-2100)
Final Results #8	#6 AND #7

CAB Abstracts

Set	Search query
Event #1	TS=(DAS24236* OR DAS-24236 OR DAS-24236-5 OR 281-24-236 OR DAS21023* OR DAS-21023 OR DAS-21Ø23-5 OR DAS-21<o>23-5 OR 3006-210-23 OR 281-24-236x3006-210-23 OR DAS-24236-5xDAS-21Ø23-5 OR DAS-24236-5xDAS-21<o>23-5 OR *281x3006* OR WideStrike* OR MXB-13)
Stack #2	TS=(DAS-24236-5xDAS-21Ø23-5xMON-88913-8 OR DAS-24236-5xDAS-21<o>23-5xMON-88913-8 OR 281-24-236x3006-210-23xMON88913 OR *281x3006x88913* OR *281x3006xMON*)
#3	#1 OR #2
Proteins #4	TS=((cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR cry1Ac OR Cry1-Ac OR cry1a-c OR cryiAc OR Cryi-Ac OR cryia-c OR (cry AND (1Ac or 1-Ac or iAc or i-Ac))) AND (Streptomyces OR viridochromogenes OR Bacillus OR thuringiensis OR bt OR cotton OR gossypium OR hirsutum 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" OR stack))
Traits #5	TS=((lepidopter* OR bollworm* OR pectinophora OR gossypiella OR corn-earworm* OR sorghum-headworm* OR helicoverpa OR armigera OR tobacco-budworm* OR heliothis OR virescens OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*)) AND (toler* OR resist* OR protec*) AND (cotton OR gossypium OR hirsutum) AND (GMHT OR transgen* OR engineer* OR lmo or lmos OR ge OR manipulat* OR transform* OR stack OR "genetically engineered foods"))
#6	#3 OR #4 OR #5
Reporting Period #7	PY=(2019-2100)
Final Results #8	#6 AND #7

MEDLINE

Set	Search query
Event #1	TS=(DAS24236* OR DAS-24236 OR DAS-24236-5 OR 281-24-236 OR DAS21023* OR DAS-21023 OR DAS-21Ø23-5 OR 3006-210-23 OR 281-24-236x3006-210-23 OR DAS-24236-5xDAS-21Ø23-5 OR *281x3006* OR WideStrike* OR MXB-13)
Stack #2	TS=(DAS-24236-5xDAS-21Ø23-5xMON-88913-8 OR 281-24-236x3006-210-23xMON88913 OR *281x3006x88913* OR *281x3006xMON*)
#3	#1 OR #2
Proteins #4	TS=((cry1f OR cry-1f OR cryif OR "cry-if" OR Cry1-f OR Cry-1-f OR (phosphinothricin AND (acetyltransferase OR acetyl-transferase)) OR (pat AND phosphinothricin) OR cry1Ac OR Cry1-Ac OR cry1a-c OR cryiAc OR Cryi-Ac OR cryia-c OR (cry AND (1Ac or 1-Ac or iAc or i-Ac))) AND (Streptomyces OR viridochromogenes OR Bacillus OR thuringiensis OR bt OR cotton OR gossypium OR hirsutum 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" OR stack))
Traits #5	TS=((lepidopter* OR bollworm* OR pectinophora OR gossypiella OR corn-earworm* OR sorghum-headworm* OR helicoverpa OR armigera OR tobacco-budworm* OR heliothis OR virescens OR glufosinate* OR gluphosinate* OR (liberty* AND herbicid*)) AND (toler* OR resist* OR protec*) AND (cotton OR gossypium OR hirsutum) AND (GMHT OR transgen* OR engineer* OR lmo or lmos OR ge OR manipulat* OR transform* OR stack OR "Food, Genetically Modified"))
#6	#3 OR #4 OR #5
Reporting Period #7	PY=(2019-2100)
Final Results #8	#6 AND #7

Europe PMC

(“DAS-24236-5xDAS-21Ø23-5xMON-88913-8” OR “281-24-236x3006-210-23xMON88913” OR 281x3006x88913 OR 281x3006xMON OR DAS24236 OR “DAS-24236” OR “281-24-236” OR DAS21023 OR “DAS-21023” OR DAS21Ø23 OR “DAS-21Ø23” OR “3006-210-23” OR “281-24-236x3006-210-23” OR “DAS-24236-5xDAS-21Ø23-5” OR 281x3006 OR WideStrike) AND (FIRST_PDATE:[2019-01-01 TO 2100-12-31])

Appendix 2. Eligibility/Inclusion Criteria

Concept	Criteria
Population (taking into account scope of the authorisation)	Publication addressing human and animal health, and/or the environment relevant for the scope of the authorisation. 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 **I**ntervention/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).
Intervention/exposure	Publications addressing the authorised GM cotton and derived food/feed products, and/or the intended traits (newly expressed protein(s) or their combination, when applicable).
Intervention/exposure Plant species	In case of studies using GM plants, only studies using cotton 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	Effects/impacts on human and animal health, and/or the environment are addressed. 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.
Reporting format	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). However, risk assessments from relevant risk assessment bodies (excluding EFSA) will not be excluded.

Appendix 3. Entries retrieved by the performed searches to literature databases for the authorised cotton events 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 2019a in one appendix and EFSA 2019b in another)

1. Entries retrieved using Web of Science Core collection

Abdelgaffar H, Tague ED, Gonzalez HFC, Campagna SR and Jurat-Fuentes JL, 2019. Midgut metabolomic profiling of fall armyworm (Spodoptera frugiperda) with field-evolved resistance to Cry1F corn. Insect Biochemistry and Molecular Biology 106, 1-9.

Abdelgaffar HM, Oppert C, Sun XC, Monserrate J and Jurat-Fuentes JL, 2019. Differential heliothine susceptibility to Cry1Ac associated with gut proteolytic activity. Pesticide Biochemistry and Physiology 153, 1-8.

Agrawal A, Venkatesan T, Ramasamy GG, Syamala RR, Muthugounder M and Rai A, Transcriptome alterations of field-evolved resistance inPectinophora gossypiellaagainst Bt Bollgard II cotton in India. Journal of Applied Entomology 12.

Ahmad S, Cheema HMN, Khan AA, Khan RSA and Ahmad JN, 2019. Resistance status of Helicoverpa armigera against Bt cotton in Pakistan. Transgenic Research 28, 199-212.

Ai XY, Ren SW, Liu N, Huang LN and Liu XN, 2019. Transgenic tobacco expressing dsRNA of the arginine kinase gene exhibits enhanced resistance against Helicoverpa armigera. Bulletin of Insectology 72, 115-124.

Akhtar MN and Farooq A, 2019. Predator Prey Interaction between Lepidopteran Pests and Coccinellids Insects of Cotton in Southern Punjab Pakistan. Pakistan Journal of Zoology 51, 583-589.

Akhtar ZR, Rasul A, Sagheer M, Ali A, Ashraf I, Saddiq B and Mansoor ul H, 2020. CHARACTERIZING THE MODE OF RESISTANCE INHERITANCE AND CROSS RESISTANCE IN PINK BOLLWORM AGAINST CRY1AC TOXIN AND ORGANOPHOSPHATE PESTICIDES IN PAKISTAN. Pakistan Journal of Agricultural Sciences 57, 1101-1106.

Alok D, Annapragada H, Singh S, Murugesan S and Singh NP, 2020. Symbiotic nitrogen fixation and endophytic bacterial community structure in Bt-transgenic chickpea (Cicer arietinum L). Scientific Reports 10, 12.

Alvarado DI, Vigil KIS, Jacobo ISB and Morenofierros L, 2019. Bacillus thuringiensis Cry1Ac toxin induces MAPKs activation and allergenic effects in intestinal and immune cells. European Journal of Immunology 49, 1356-1356.

Amaral FSA, Guidolin AS, Salmeron E, Kanno RH, Padovez FEO, Fatoretto JC and Omoto C, 2020. Geographical distribution of Vip3Aa20 resistance allele frequencies in Spodoptera frugiperda (Lepidoptera: Noctuidae) populations in Brazil. Pest Management Science 76, 169-178.

Amin MR, Oh SD, Bae E, Park SY and Suh SJ, Impact of insect-resistant transgenic rice on above-ground non-target arthropods in Korea. Entomological Research 14.

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.

Anderson JA, Ellsworth PC, Faria JC, Head GP, Owen MDK, Pilcher CD, Shelton AM and Meissle M, 2019. Genetically Engineered Crops: Importance of Diversified Integrated Pest Management for Agricultural Sustainability. Frontiers in Bioengineering and Biotechnology 7, 14.

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.

Anjum R, Baloch MJ, Baloch GM and Chachar Q, 2019. SIGNIFICANCE OF CROSS COMBINATIONS FOR DEVELOPING Bt COTTON VARIETIES FOR OPTIMUM GENE (CRY1AC) EXPRESSION LEVEL REQUIRED FOR BETTER BOLLWORM CONTROL. Journal of Animal and Plant Sciences 29, 531-538.

Aziz E, Batool R, Akhtar W, Rehman S, Gregersen PL and Mahmood T, 2019. Expression analysis of the polyphenol oxidase gene in response to signaling molecules, herbivory and wounding in antisense transgenic tobacco plants. 3 Biotech 9, 13.

Bahar MH, Stanley J, Backhouse D, Mensah R, Del Socorro A and Gregg P, 2019. Survival of Helicoverpa armigera larvae on and Bt toxin expression in various parts of transgenic Bt cotton (Bollgard II) plants. Entomologia Experimentalis Et Applicata 167, 415-423.

Bally J, Fishilevich E, Doran RL, Lee K, de Campos SB, German MA, Narva KE and Waterhouse PM, 2020. Plin-amiR, a pre-microRNA-based technology for controlling herbivorous insect pests. Plant Biotechnology Journal 18, 1925-1932.

Bel Y, Zack M, Narva K and Escriche B, 2019. Specific binding of Bacillus thuringiensis Cry1Ea toxin, and Cry1Ac and Cry1Fa competition analyses in Anticarsia gemmatalis and Chrysodeixis includens. Scientific Reports 9, 7.

Bilbo TR, Reay-Jones FPF, Reisig DD and Greene JK, 2019. Susceptibility of Corn Earworm (Lepidoptera: Noctuidae) to Cry1A.105 and Cry2Ab2 in North and South Carolina. Journal of Economic Entomology 112, 1845-1857.

Bilbo TR, Reay-Jones FPF, Reisig DD, Greene JK and Turnbull MW, 2019. Development, survival, and feeding behavior of Helicoverpa zea (Lepidoptera: Noctuidae) relative to Bt protein concentrations in corn ear tissues. Plos One 14, 25.

Bilbo TR, Reay-Jones FPF and Greene JK, 2020. Evaluation of Insecticide Thresholds in Late-Planted Bt and Non-Bt Corn for Management of Fall Armyworm (Lepidoptera: Noctuidae). Journal of Economic Entomology 113, 814-823.

Boaventura D, Ulrich J, Lueke B, Bolzan A, Okuma D, Gutbrod O, Geibel S, Zeng Q, Dourado PM, Martinelli S, Flagel L, Head G and Nauen R, 2020. Molecular characterization of CryiF resistance in fall armyworm, Spodoptera frugiperda from Brazil. Insect Biochemistry and Molecular Biology 116, 11.

Bonilla-Barrientos O, Hernandez-Leal E, Verastegui-Chavez J, Maltos-Buendia J, Bautista-Ramirez E, Hernandez-Bautista A and Isidro-Requejo LM, 2020. PRODUCTIVITY AND FIBER QUALITY OF CONVENTIONAL COTTON VARIETIES AT THE COMARCA LAGUNERA, MEXICO. Revista Fitotecnia Mexicana 43, 3-9.

Boonchaisri S, Rochfort S, Stevenson T and Dias DA, 2019. Recent developments in metabolomics-based research in understanding transgenic grass metabolism. Metabolomics 15, 19.

Boonmee K, Thammasittirong SNR and Thammasittirong A, 2019. Molecular characterization of lepidopteran-specific toxin genes in Bacillus thuringiensis strains from Thailand. 3 Biotech 9, 11.

Botha AS, Erasmus A, du Plessis H and Van den Berg J, 2019. Efficacy of Bt Maize for Control of Spodoptera frugiperda (Lepidoptera: Noctuidae) in South Africa. Journal of Economic Entomology 112, 1260-1266.

Bowling AJ, Sopko MS, Tan SY, Larsen CM, Pence HE and Zack MD, 2019. Insecticidal

Activity of a Vip3Ab1 Chimera Is Conferred by Improved Protein Stability in the Midgut of Spodoptera eridania. Toxins 11, 17.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Helicoverpa zea (Lepidoptera: Noctuidae) Preference for Plant Structures, and Their Location, Within Bt Cotton Under Different Nitrogen and Irrigation Regimes. Journal of Economic Entomology 112, 1741-1751.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Helicoverpa zea (Lepidoptera: Noctuidae) Oviposition and Larval Vertical Distribution in Bt Cotton Under Different Levels of Nitrogen and Irrigation. Journal of Economic Entomology 112, 1237-1250.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Development and Dispersal of Helicoverpa zea (Lepidoptera: Noctuidae) on Non-Bt and Bt Pyramided Cotton. Environmental Entomology 48, 465-477.

Britz C, Van den Berg J and Du Plessis H, 2020. Susceptibility of Spodoptera littoralis (Boisduval) (Lepidoptera: Noctuidae) to Bt cotton, expressing Cry1Ac and Cry2Ab toxins, in South Africa. African Entomology 28, 182-186.

Campos SO, Santana IV, Silva C, Santos-Amaya OF, Guedesa RNC and Pereira EJG, 2019. Bt-induced hormesis in Bt-resistant insects: Theoretical possibility or factual concern? Ecotoxicology and Environmental Safety 183, 8.

Caprio MA, Kurtz R, Catchot A, Kerns D, Reisig D, Gore J and Reay-Jones FPF, 2019. The Corn-Cotton Agroecosystem in the Mid-Southern United States: What Insecticidal Event Pyramids Should be Used in Each Crop to Extend Vip3A Durability. Journal of Economic Entomology 112, 2894-2906.

Carriere Y, Degain B, Unnithan GC, Harpold VS, Li XC and Tabashnik BE, 2019. Seasonal Declines in Cry1Ac and Cry2Ab Concentration in Maturing Cotton Favor Faster Evolution of Resistance to Pyramided Bt Cotton in Helicoverpa zea (Lepidoptera: Noctuidae). Journal of Economic Entomology 112, 2907-2914.

Carriere Y, Yelich AJ, Degain B, Harpold VS, Unnithan GC, Kim JH, Mathew LG, Head GP, Rathore KS, Fabrick JA and Tabashnik BE, 2019. Gossypol in cottonseed increases the fitness cost of resistance to Bt cotton in pink bollworm. Crop Protection 126, 8.

Carriere Y, Brown ZS, Downes SJ, Gujar G, Epstein G, Omoto C, Storer NP, Mota-Sanchez D, Sogaard Jorgensen P and Carroll SP, 2020. Governing evolution: A socioecological comparison of resistance management for insecticidal transgenic Bt crops among four countries. Ambio 49, 1-16.

Chen WB, Yang XW, Tetreau G, Song XZ, Coutu C, Hegedus D, Blissard G, Fei ZJ and Wang P, 2019. A high-quality chromosome-level genome assembly of a generalist herbivore, Trichoplusia ni. Molecular Ecology Resources 19, 485-496.

Chen Y, Li YB, Zhou MY, Cai ZZ, Tambel LIM, Zhang X, Chena Y and Chen D, 2019. Nitrogen deficit decreases seed Cry1Ac endotoxin expression in Bt transgenic cotton. Plant Physiology and Biochemistry 141, 114-121.

Cherif A and Verheggen F, 2019. A review of Tuta absoluta (Lepidoptera: Gelechiidae) host plants and their impact on management strategies. Biotechnologie Agronomie Societe Et Environnement 23, 270-278.

Crow W, Gore J, Catchot AL, Cook DR, Stewart SD, Seiter NJ, Studebaker G, Lorenz G, Kerns D, Brown S, Jones MM, Musser F and Towles T, 2020. Termination of Insecticide Applications for Tarnished Plant Bug (Hemiptera: Miridae) Management in Cotton. Journal of Cotton Science 24, 17-26.

da Silva G, Ramos LFC, Seckler HD, Gomes FM, Cortines JR, Ramos I, Anobom CD,

Machado ED and de Oliveira DMP, 2019. Biochemical characterization of digestive membrane-associated alkaline phosphatase from the velvet bean caterpillar Anticarsia gemmatalis. Archives of Insect Biochemistry and Physiology 102, 14.

de Bortoli CP and Jurat-Fuentes JL, 2019. Mechanisms of resistance to commercially relevant entomopathogenic bacteria. Current opinion in insect science 33, 56-62.

De Paulo PD, Fadini MAM, Marinho CGS and Mendes SM, 2019. DIRECT DEFENSE ELICITED BY Tetranychus urticae KOCH (Acari: Tetranychidae) IN Bt MAIZE PLANTS. Bioscience Journal 35, 903-909.

de Souza MWR, Ferreira EA, dos Santos JB, Soares MA, Castro B and Zanuncio JC, 2020. Fluorescence of chlorophyll a in transgenic maize with herbicide application and attacked by Spodoptera frugiperda (Lepidoptera: Noctuidae). Phytoparasitica 48, 567-573.

Deng JX, Wang YM, Yang FY, Liu Y and Liu B, 2019. Persistence of insecticidal Cry toxins in Bt rice residues under field conditions estimated by biological and immunological assays. Science of the Total Environment 679, 45-51.

Dessoky ES, Ismail RM, Elarabi NI, Abdelhadi AA and Abdallah NA, 2021. Improvementofsugarcane for borer resistance using Agrobacterium mediated transformation of cry1Ac gene. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 12, 47-56.

Dhanaraj AL, Willse AR and Kamath SP, 2019. Stability of expression of Cry1Ac and Cry2Ab2 proteins in Bollgard-II hybrids at different stages of crop growth in different genotypes across cropping seasons and multiple geographies. Transgenic Research 28, 33-50.

Dhania NK, Chauhan VK, Chaitanya RK and Dutta-Gupta A, 2019. Midgut de novo transcriptome analysis and gene expression profiling of Achaea janata larvae exposed with Bacillus thuringiensis (Bt)-based biopesticide formulation. Comparative Biochemistry and Physiology D-Genomics & Proteomics 30, 81-90.

Ding RF, Ma DY, Uwais A, Wang DM, Liu J, Xu Y, Li HB, Li HQ and Pan HS, 2019. Transgenic Cry1Ac cotton does not affect the development and fecundity of Chrysoperla carnea. Plos One 14, 12.

Dominguez-Mendez R, Alcantara-de la Cruz R, Rojano-Delgado AM, da Silveira HM, Portugal J, Cruz-Hipolito HE and De Prado R, 2019. Stacked traits conferring multiple resistance to imazamox and glufosinate in soft wheat. Pest Management Science 75, 648-657.

Dong S, Liu Y, Zhang X, Xu CX, Liu XJ and Zhang CZ, 2019. Development of an immunochromatographic assay for the specific detection of Bacillus thuringiensis (Bt) Cry1Ab toxin. Analytical biochemistry 567, 1-7.

Dong S, Gao MJ, Bo ZY, Guan LJ, Hu XD, Zhang HXY, Liu BB, Li P, He KL, Liu XJ and Zhang CZ, 2020. Production and characterization of a single-chain variable fragment antibody from a site-saturation mutagenesis library derived from the anti-Cry1A monoclonal antibody. International Journal of Biological Macromolecules 149, 60-69.

Dong S, Gao MJ, Guan LJ, Zhang HXY, Wang YL, Liu BB, Li P, Qiao K, Liu XJ and Zhang CZ, 2020. Construction, Expression, and Identification of Double Light Chain (V-L-V-L) Antibody from a Unique Bt Cry1-Specific Monoclonal Antibody. Food Analytical Methods 13, 1570-1582.

Eghrari K, de Brito AH, Baldassi A, Balbuena TS, Fernandes OA and Moro GV, 2019. Homozygosis of Bt locus increases Bt protein expression and the control of Spodoptera frugiperda (Lepidoptera: Noctuidae) in maize hybrids. Crop Protection

124, 7.
Eisenring M, Naranjo SE, Bacher S, Abbott A, Meissle M and Romeis J, 2019. Reduced caterpillar damage can benefit plant bugs in Bt cotton. Scientific Reports 9, 9.
Erlandson MA, Toprak U and Hegedus DD, 2019. Role of the peritrophic matrix in insect-pathogen interactions. Journal of insect physiology 117, 11.
Fabrick JA, LeRoy DM, Unnithan GC, Yelich AJ, Carriere Y, Li XC and Tabashnik BE, 2020. Shared and Independent Genetic Basis of Resistance to Bt Toxin Cry2Ab in Two Strains of Pink Bollworm. Scientific Reports 10, 11.
Fabrick JA, Mathew LG, LeRoy DM, Hull JJ, Unnithan GC, Yelich AJ, Carriere Y, Li XC and Tabashnik BE, 2020. Reduced cadherin expression associated with resistance to Bt toxin Cry1Ac in pink bollworm. Pest Management Science 76, 67-74.
Fand BB, Nagrare S, Gawande SP, Nagrale UT, Naikwadi BV, Deshmukh V, Gokte-Narkhedkar N and Waghmare VN, 2019. Widespread infestation of pink bollworm, Pectinophora gossypiella (Saunders) (Lepidoptera: Gelechidae) on Bt cotton in Central India: a new threat and concerns for cotton production. Phytoparasitica 47, 313-325.
Fard ZM, Hesami S, Marzban R and Jouzani GS, 2020. Individual and Combined Biological Effects of Bacillus thuringiensis and Multicapsid Nucleopolyhedrovirus on the Biological Stages of Egyptian Cotton Leafworm, Spodoptera littoralis (B.) (Lep.: Noctuidae). Journal of Agricultural Science and Technology 22, 465-476.
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.
Fernandes MG, Costa E, Dutra CC and Raizer J, 2019. Species Richness and Community Composition of Ants and Beetles in Bt and non-Bt Maize Fields. Environmental Entomology 48, 1095-1103.
Figueiredo CS, Zara FJ and Desiderio JA, Effect of the Cry1, Cry2 and Vip3 protein combinations on the control ofAnticarsia gemmatalis(Erebidae) andChrysodeixis includens(Noctuidae) Lepidoptera. International Journal of Pest Management 9.
Figueiredo CS, Lemes ARN, Sebastiao I and Desiderio JA, 2019. Synergism of the Bacillus thuringiensis Cry1, Cry2, and Vip3 Proteins in Spodoptera frugiperda Control. Applied Biochemistry and Biotechnology 188, 798-809.
Fritz ML, Nunziata SO, Guo R, Tabashnik BE and Carriere Y, 2020. Mutations in a Novel Cadherin Gene Associated with Bt Resistance in Helicoverpa zea. G3-Genes Genomes Genetics 10, 1563-1574.
Fu JM and Liu B, 2020. Enhanced yield performance of transgenic cry1C* rice in saline-alkaline soil. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 11, 97-112.
Fu S, Liu ZX, Chen JZ, Sun GX, Jiang YX, Li MW, Xiong L, Chen SP, Zhou YQ, Asad M and Yang G, 2020. Silencing arginine kinase/integrin beta(1) subunit by transgenic plant expressing dsRNA inhibits the development and survival of Plutella xylostella. Pest Management Science 76, 1761-1771.
Gao MJ, Dong S, Hu XD, Zhang X, Liu Y, Zhong JF, Lu LN, Wang Y, Chen LM and Liu XJ, 2019. Roles of Midgut Cadherin from Two Moths in Different Bacillus thuringiensis Action Mechanisms: Correlation among Toxin Binding, Cellular Toxicity, and Synergism. Journal of Agricultural and Food Chemistry 67, 13237-13246.
Gao MJ, Liu Y, Wang Y, Zhang X, Dong S and Liu XJ, 2019. Newly identified APN splice isoforms suggest novel splicing mechanisms may underlie circRNA circularization

in moth. Febs Open Bio 9, 1521-1535.

Gao JH, Qian HM, Guo XQ, Mi Y, Guo JP, Zhao JL, Xu C, Zheng T, Duan M, Tang ZW, Lin CY, Shen ZC, Jiang YW and Wang XC, 2020. The signal peptide of Cry1Ia can improve the expression of eGFP or mCherry in Escherichia coli and Bacillus thuringiensis and enhance the host's fluorescent intensity. Microbial Cell Factories 19, 19.

Garcia AG, Ferreira CP, Godoy WAC and Meagher RL, 2019. A computational model to predict the population dynamics of Spodoptera frugiperda. Journal of Pest Science 92, 429-441.

Garcia-Gomez BI, Cano SN, Zagal EE, Dantan-Gonzalez E, Bravo A and Soberon M, 2019. Insect Hsp90 Chaperone Assists Bacillus thuringiensis Cry Toxicity by Enhancing Protoxin Binding to the Receptor and by Protecting Protoxin from Gut Protease Degradation. mBio 10, 12.

Gartia J, Barnwal RP, Anangi R, Giri AR, King G and Chary KVR, 2019. H-1, C-13 and N-15 NMR assignments of two plant protease inhibitors (IRD7 and IRD12) from the plant Capsicum annuum. Biomolecular NMR assignments 13, 31-35.

Ghazanfar MU, Hagenbucher S, Romeis J, Grabenweger G and Meissle M, 2020. Fluctuating temperatures influence the susceptibility of pest insects to biological control agents. Journal of Pest Science 93, 1007-1018.

Giron-Calva PS, Twyman RM, Albajes R, Gatehouse AMR and Christou P, 2020. The Impact of Environmental Stress on Bt Crop Performance. Trends in Plant Science 25, 264-278.

Goncalves J, Rodrigues JVC, Santos-Amaya OF, Paula-Moraes SV and Pereira EJG, 2020. The oviposition behavior of fall armyworm moths is unlikely to compromise the refuge strategy in genetically modified Bt crops. Journal of Pest Science 93, 965-977.

Gong LJ, Kang S, Zhou JL, Sun D, Guo L, Qin JY, Zhu LH, Bai Y, Ye F, Akami M, Wu QJ, Wang SL, Xu BY, Yang ZX, Bravo A, Soberon M, Guo ZJ, Wen LZ and Zhang YJ, 2020. Reduced Expression of a Novel Midgut Trypsin Gene Involved in Protoxin Activation Correlates with Cry1Ac Resistance in a Laboratory-Selected Strain of Plutella xylostella (L.). Toxins 12, 15.

Grizanova EV, Krytsyna TI, Surcova VS and Dubovskiy IM, 2019. The role of midgut nonspecific esterase in the susceptibility of Galleria mellonella larvae to Bacillus thuringiensis. Journal of Invertebrate Pathology 166, 3.

Guan F, Zhang JP, Shen HW, Wang XL, Padovan A, Walsh TK, Tay WT, Gordon KHJ, James W, Czepak C, Otim MH, Kachigamba D and Wu YD, Whole-genome sequencing to detect mutations associated with resistance to insecticides and Bt proteins inSpodoptera frugiperda. Insect Science 12.

Guan RB, Chen QY, Li HC, Hu SR, Miao XX, Wang GR and Yang B, 2019. Knockout of the HaREase Gene Improves the Stability of dsRNA and Increases the Sensitivity of Helicoverpa armigera to Bacillus thuringiensis Toxin. Frontiers in Physiology 10, 11.

Gulzar A, Mukhtar T and Wright DJ, 2020. Effects of entomopathogenic nematodes Steinernema carpocapsae and Heterorhabditis bacteriophora on the fitness of a Vip3A resistant subpopulation of Heliothis virescens (Noctuidae: Lepidoptera). Bragantia 79, 281-292.

Guo W, Kain W and Wang P, 2019. Effects of disruption of the peritrophic membrane on larval susceptibility to Bt toxin Cry1Ac in cabbage loopers. Journal of insect physiology 117, 6.

Guo ZJ, Sun D, Kang S, Zhou JL, Gong LJ, Qin JY, Guo L, Zhu LH, Bai Y, Luo L and Zhang YJ, 2019. CRISPR/Cas9-mediated knockout of both the PxABCC2 and PxABCC3 genes confers high-level resistance to Bacillus thuringiensis Cry1Ac toxin in the diamondback moth, Plutella xylostella (L.). Insect Biochemistry and Molecular Biology 107, 31-38.

Guo ZJ, Gong LJ, Kang S, Zhou JL, Sun D, Qin JY, Guo L, Zhu LH, Bai Y, Bravo A, Soberon M and Zhang YJ, 2020. Comprehensive analysis of Cry1Ac protoxin activation mediated by midgut proteases in susceptible and resistant Plutella xylostella (L.). Pesticide Biochemistry and Physiology 163, 23-30.

Gupta R, Baruah AM, Acharjee S and Sarmah BK, 2020. Compositional analysis of transgenic Bt-chickpea resistant to Helicoverpa armigera. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 11, 262-274.

Hao J, Li YH, Wang JX, Xu CX, Gao MJ, Chen W, Zhang X, Hu XD, Liu Y and Liu XJ, 2020. Screening and activity identification of an anti-idiotype nanobody for Bt Cry1F toxin from the camelid naive antibody phage display library. Food and Agricultural Immunology 31, 16.

Hazarika N, Boruah RR, Handique PJ, Acharjee S and Sarmah BK, 2019. Reconstruction and validation of three different binary vectors suitable for generation of genetically engineered Helicoverpa protected crops. Indian Journal of Genetics and Plant Breeding 79, 104-108.

Herrero MI, Fogliata SV, Dami LC, Casmuz A, Gastaminza G and Murua MG, 2019. Lack of reproductive isolation in Helicoverpa gelotopoeon (Lepidoptera: Noctuidae) populations from different host plant species in Argentina. Florida Entomologist 102, 291-297.

Huang FN, Resistance of the fall armyworm,Spodoptera frugiperda, to transgenicBacillus thuringiensisCry1F corn in the Americas: lessons and implications for Bt corn IRM in China. Insect Science 16.

Huang CW, Chen WJ, Ke X, Li YH and Luan YX, 2019. A multi-generational risk assessment of Cry1F on the non-target soil organism Folsomia candida (Collembola) based on whole transcriptome profiling. Peerj 7, 18.

Huang JL, Xu YJ, Zuo YY, Yang YH, Tabashnik BE and Wu YD, 2020. Evaluation of five candidate receptors for three Bt toxins in the beet armyworm using CRISPR-mediated gene knockouts. Insect Biochemistry and Molecular Biology 121, 9.

Hussain T, Aksoy E, Caliskan ME and Bakhsh A, 2019. Transgenic potato lines expressing hairpin RNAi construct of molting-associated EcR gene exhibit enhanced resistance against Colorado potato beetle (Leptinotarsa decemlineata, Say). Transgenic Research 28, 151-164.

Hussain T, Zia K, Arif MJ and Javed N, 2019. Varietal Expression of Cry1Ac in Cotton and its Concentration Effect on Helicoverpa armigera under Laboratory Conditions. International Journal of Agriculture and Biology 21, 577-582.

Iqbal N, Manalil S, Chauhan BS and Adkins SW, 2019. Glyphosate-tolerant cotton in Australia: successes and failures. Archives of Agronomy and Soil Science 65, 1536-1553.

Jadhav MS, Rathnasamy SA, Natarajan B, Duraialagaraja S and Varatharajalu U, 2020. Study of Expression of Indigenous Bt cry2AX1 Gene in T-3 Progeny of Cotton and its Efficacy Against Helicoverpa armigera (Hubner). Brazilian Archives of Biology and Technology 63, 11.

Jalapathi SK, Jayaraj J, Shanthi M, Theradimani M, Venkatasamy B, Irulandi S and Prabhu S, 2020. Potential of Cry1Ac fromBacillus thuringiensisagainst the tomato

pinworm,Tuta absoluta(Meyrick) (Gelechiidae: Lepidoptera). Egyptian Journal of Biological Pest Control 30, 4.

Jaleel W, Saeed S, Naqqash MN, Sial MU, Ali M, Zaka SM, Sarwar ZM, Ishtiaq M, Qayyum MA, Ul Aine Q, Anwar A, Sarmad M, Azad R, Latif M, Ahmed F, Islam W, Khan KA and Ghramh HA, 2020. Effects of temperature on baseline susceptibility and stability of insecticide resistance against Plutella xylostella (Lepidoptera: Plutellidae) in the absence of selection pressure. Saudi journal of biological sciences 27, 1-5.

Jamil S, Shahzad R, Rahman SU, Iqbal MZ, Yaseen M, Ahmad S and Fatima R, 2021. The level of Cry1Ac endotoxin and its efficacy against H. armigera in Bt cotton at large scale in Pakistan. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 12, 1-17.

Jerga A, Evdokimov AG, Moshiri F, Haas JA, Chen M, Clinton W, Fu XR, Halls C, Jimenez-Juarez N, Kretzler CN, Panosian TD, Pleau M, Roberts JK, Rydel TJ, Salvador S, Sequeira R, Wang YF, Zheng MY and Baum JA, 2019. Disabled insecticidal proteins: A novel tool to understand differences in insect receptor utilization. Insect Biochemistry and Molecular Biology 105, 79-88.

Jiang K, Zhang Y, Chen Z, Wu DL, Cai J and Gao X, 2020. Structural and Functional Insights into the C-terminal Fragment of Insecticidal Vip3A Toxin ofBacillus thuringiensis. Toxins 12, 15.

Jin MH, Liao CY, Chakrabarty S, Wu KM and Xiao YT, 2019. Comparative Proteomics of Peritrophic Matrix Provides an Insight into its Role in Cry1Ac Resistance of Cotton Bollworm Helicoverpa armigera. Toxins 11, 14.

Jones CM, Parry H, Tay WT, Reynolds DR and Chapman JW, 2019. Movement Ecology of Pest Helicoverpa: Implications for Ongoing Spread. In: Annual Review of Entomology, Vol 64. Ed Douglas AE. Annual Reviews, Palo Alto, 277-295.

Jung YJ, Yoo SH, Choi W, Lee JR and Moon JC, 2019. Purification of the Cry1Ac protein of Bacillus thuringiensis and assessment against the Plutella xylostella and soil microbial community. Entomological Research 49, 501-508.

Karar H, Bashir MA, Haider M, Haider N, Khan KA, Ghramh HA, Ansari MJ, Mutlu C and Alghanem SM, 2020. Pest susceptibility, yield and fiber traits of transgenic cotton cultivars in Multan, Pakistan. Plos One 15, 15.

Katta S, Talakayala A, Reddy MK, Addepally U and Garladinne M, 2020. Development of transgenic cotton (Narasimha) using triple gene Cry2Ab-Cry1F-Cry1Ac construct conferring resistance to lepidopteran pest. Journal of Biosciences 45, 11.

Kaur G, Guo JG, Brown S, Head GP, Price PA, Paula-Moraes S, Ni XZ, Dimase M and Huang F, 2019. Field-evolved resistance of Helicoverpa zea (Boddie) to transgenic maize expressing pyramided Cry1A.105/Cry2Ab2 proteins in northeast Louisiana, the United States. Journal of Invertebrate Pathology 163, 11-20.

Kayam D, Tirupati MK and Karanam HP, 2020. Diversity of Bacillus thuringiensis cry genes in soils of Andhra Pradesh, India. Indian Journal of Biochemistry & Biophysics 57, 471-480.

Kim YJ, Kloos S, Romeis J and Meissle M, Effects of mCry51Aa2-producing cotton on the non-target spider miteTetranychus urticaeand the predatory bugOrius majusculus. Journal of Pest Science 12.

Kranthi KR and Stone GD, 2020. Long-term impacts of Bt cotton in India. Nature Plants 6, 188-+.

Krogh PH, Kostov K and Damgaard CF, The effect ofBtcrops on soil invertebrates: a systematic review and quantitative meta-analysis. Transgenic Research 12.

Kumar R, Kranthi S, Rao G, Desai H, Bheemanna H, Dharajothi B, Choudhary A and Kranthi KR, Assessment of bollworm damage and yield loss in seed blends of Bollgard-II with corresponding Non-Bt hybrid as 'built in refuge' in cotton. Phytoparasitica 11.

Kumar R, Choudhary A, Kumar S and Shivangi, 2019. Frequency of alleles conferring resistance to Bt cotton in North Zone populations of the spotted bollworm, Earias insulana (Boisduval). African Entomology 27, 58-65.

Kuwardadra SI, Bhatt KC, Paliwal A, Sood P, Malav PK, Sodhi KK and Randhawa G, 2020. Monitoring adventitious presence of transgenes in brinjal (Solanum melongena L.) collections from the regions in India bordering Bangladesh: a case report. Genetic Resources and Crop Evolution 67, 1181-1192.

Levine SL, Fridley JM and Uffman JP, 2019. Assessing the Potential for Interaction in Insecticidal Activity Between MON 87751 x MON 87701 Produced by Conventional Breeding. Environmental Entomology 48, 1241-1248.

Li GP, Huang JR, Ji TJ, Tian CH, Zhao XC and Feng HQ, Baseline susceptibility and resistance allele frequency inOstrinia furnacalisrelated to Cry1 toxins in the Huanghuaihai summer corn region of China. Pest Management Science 7.

Li XW, Du LX, Zhang L, Peng YF, Hua HX, Romeis J and Li YH, ReducedMythimna separatainfestation onBtcorn could benefit aphids. Insect Science 8.

Li Z, Wang XH, Saurav PS, Li CX, Zhao M, Xin SR, Parajulee MN and Chen FJ, Impacts of Bt maize inoculated with rhizobacteria on development and food utilization of Mythimna separata. Journal of Applied Entomology 10.

Li R, Yang SS, Qiu XF, Lu XQ, Hu QF, Ren XM, Wu BB, Qi LL, Ding XZ, Xia LQ and Sun YJ, 2019. The conserved cysteine residues in Bacillus thuringiensis Cry1Ac protoxin are not essential for the bipyramidal crystal formation. Journal of Invertebrate Pathology 163, 82-85.

Li SY, Hussain F, Unnithan GC, Dong SL, UlAbdin Z, Gu SH, Mathew LG, Fabrick JA, Ni XZ, Carriere Y, Tabashnik BE and Li XC, 2019. A long non-coding RNA regulates cadherin transcription and susceptibility to Bt toxin Cry1Ac in pink bollworm, Pectinophora gossypiella. Pesticide Biochemistry and Physiology 158, 54-60.

Li X, Ouyang XF, Zhang ZS, He L, Wang Y, Li YH, Zhao J, Chen Z, Wang CN, Ding LL, Pei Y and Xiao YH, 2019. Over-expression of the red plant gene R1 enhances anthocyanin production and resistance to bollworm and spider mite in cotton. Molecular Genetics and Genomics 294, 469-478.

Li H, Zhang J, Ma T, Li C, Ma ZQ and Zhang X, 2020. Acting target of toosendanin locates in the midgut epithelium cells of Mythimna separate Walker larvae (lepidoptera: Noctuidae). Ecotoxicology and Environmental Safety 201, 6.

Li SZ, De Mandal S, Xu XX and Jin FL, 2020. The Tripartite Interaction of Host Immunity-Bacillus thuringiensisInfection-Gut Microbiota. Toxins 12, 17.

Li XY, Miyamoto K, Takasu Y, Wada S, Iizuka T, Adegawa S, Sato R and Watanabe K, 2020. ATP-Binding Cassette Subfamily a Member 2 Is a Functional Receptor for Bacillus thuringiensis Cry2A Toxins in Bombyx mori, But Not for Cry1A, Cry1C, Cry1D, Cry1F, or Cry9A Toxins. Toxins 12, 14.

Li YH, Hallerman EM, Wu KM and Peng YF, 2020. Insect-Resistant Genetically Engineered Crops in China: Development, Application, and Prospects for Use. In: Annual Review of Entomology, Vol 65. Ed Douglas AE. Annual Reviews, Palo Alto, 273-292.

Liao JY, Xue YQ, Xiao GJ, Xie M, Huang ST, You SJ, Wyckhuys KAG and You MS,

2019. Inheritance and fitness costs of resistance to Bacillus thuringiensis toxin Cry2Ad in laboratory strains of the diamondback moth, Plutella xylostella (L.). Scientific Reports 9, 8.

Little NS, Elkins BH, Mullen RM, Perera OP, Parys KA, Allen KC and Boykin DL, 2019. Differences between two populations of bollworm, Helicoverpa zea (Lepidoptera: Noctuidae), with variable measurements of laboratory susceptibilities to Bt toxins exposed to non-Bt and Bt cottons in large field cages. Plos One 14, 16.

Liu A, Huang XF, Gong LJ, Guo ZJ, Zhang YJ and Yang ZX, 2019. Characterization of immune-related PGRP gene expression and phenoloxidase activity in Cry1Ac-susceptible and -resistant Plutella xylostella (L.). Pesticide Biochemistry and Physiology 160, 79-86.

Liu J, NanGong ZY, Zhang J, Song P, Tang Y, Gao Y and Wang QY, 2019. Expression and characterization of two chitinases with synergistic effect and antifungal activity from Xenorhabdus nematophila. World journal of microbiology & biotechnology 35, 10.

Liu YM, Li YH, Chen XP, Song XY, Shen P and Peng YF, 2019. No detrimental effect of Bt maize pollen containing Cry1Ab/2Aj or Cry1Ac on adult green lacewings Chrysoperla sinica Tjeder. Journal of Integrative Agriculture 18, 893-899.

Liu J, Wang LC, Zhou GN, Gao SH, Sun TH, Liu JX and Gao BJ, 2020. Midgut transcriptome analysis of Clostera anachoreta treated with lethal and sublethal Cry1Ac protoxin. Archives of Insect Biochemistry and Physiology 103, 25.

Liu LP, Guo RQ, Qin Q, Fu JM and Liu B, 2020. Expression of Bt Protein in Transgenic Bt Cotton Plants and Ecological Fitness of These Plants in Different Habitats. Frontiers in Plant Science 11, 9.

Liu SY, Wang S, Wu SW, Wu YD and Yang YH, 2020. Proteolysis activation of Cry1Ac and Cry2Ab protoxins by larval midgut juice proteases from Helicoverpa armigera. Plos One 15, 10.

Liu WB, Wu LR, Wang J, Li XB, Jin XB and Zhu JY, 2020. Activity of Vip3Aa1 against Periplaneta americana. Open Life Sciences 15, 133-144.

Liu WX, Liu XR, Liu C, Zhang Z and Jin WJ, 2020. Development of a sensitive monoclonal antibody-based sandwich ELISA to detect Vip3Aa in genetically modified crops. Biotechnology Letters 42, 1467-1478.

Liu YB, Luo ZL, Zhao YM and Xiao NW, 2020. The selective feeding of cotton bollworms (Helicoverpa armigera) on transgenic and non-transgenic cotton leaves from consecutive cultivation fields. International Journal of Pest Management 66, 195-200.

Liu ZX, Fu S, Ma XL, Baxter SW, Vasseur L, Xiong L, Huang YP, Yang G, You SJ and You MS, 2020. Resistance toBacillus thuringiensisCry1Ac toxin requires mutations in twoPlutella xylostellaATP-binding cassette transporter paralogs. PLoS Pathogens 16, 23.

Lohn AF, Trtikova M, Chapela I, Van den Berg J, du Plessis H and Hilbeck A, 2020. Transgene behavior inZea maysL. crosses across different genetic backgrounds: Segregation patterns,cry1Abtransgene expression, insecticidal protein concentration and bioactivity against insect pests. Plos One 15, 28.

Luz PMC, Specht A, Paula-Moraes SV, Malaquias JV, Ferreira LFM, Otanasio PN and Diniz IR, 2019. Owlet moths (Lepidoptera: Noctuoidea) associated with Bt and non-Bt soybean in the brazilian savanna. Brazilian Journal of Biology 79, 248-256.

Lv J, Zhang X, Gao TT, Cui TT, Peng Q, Zhang J and Song FP, 2019. Effect of the spoIIID mutation on mother cell lysis in Bacillus thuringiensis. Applied Microbiology and

Biotechnology 103, 4103-4112.

Ma YM, Zhang JF, Xiao YT, Yang YC, Liu CX, Peng R, Yang YB, Bravo A, Soberon M and Liu KY, 2019. The Cadherin Cry1Ac Binding-Region is Necessary for the Cooperative Effect with ABCC2 Transporter Enhancing Insecticidal Activity of Bacillus thuringiensis Cry1Ac Toxin. Toxins 11, 18.

Ma JH, Tian CY, Lyu GH and Mai WX, 2020. Does cotton bollworm show cross-resistance to the Bacillus thuringiensis toxins Cry1Ac and Cry2Ab? A mini review. Journal of Arid Land 12, 349-356.

Machado EP, Rodrigues GL, Somavilla JC, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, Survival and development ofSpodoptera eridania,Spodoptera cosmioidesandSpodoptera albula(Lepidoptera: Noctuidae) on genetically-modified soybean expressingCry1AcandCry1Fproteins. Pest Management Science 7.

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.

Malaquias JB, Caprio MA, Godoy WAC, Omoto C, Ramalho FS and Pach JKS, 2020. Experimental and theoretical landscape influences on Spodoptera frugiperda movement and resistance evolution in contaminated refuge areas of Bt cotton. Journal of Pest Science 93, 329-340.

Mansoor MM and Shad SA, Inheritance of polygenic but stable pyriproxyfen resistance in a bio-control agentChrysoperla carnea(Neuroptera: Chrysopidae): cross-resistance and realized heritability. Pest Management Science 9.

Marotti I, Whittaker A, Benedettelli S, Dinelli G and Bosi S, 2020. Evaluation of the propensity of interspecific hybridization between oilseed rape (Brassica napus L.) to wild-growing black mustard (Brassica nigra L.) displaying mixoploidy. Plant Science 296, 9.

Marques LH, Santos AC, Castro BA, Moscardini VF, Rosseto J, Silva O and Babcock JM, 2019. Assessing the Efficacy of Bacillus thuringiensis (Bt) Pyramided Proteins Cry1F, Cry1A.105, Cry2Ab2, and Vip3Aa20 Expressed in Bt Maize Against Lepidopteran Pests in Brazil. Journal of Economic Entomology 112, 803-811.

Mendoza-Almanza G, Rocha-Zavaleta L, Aguilar-Zacarias C, Ayala-Lujan J and Olmos J, 2019. Cry1A Proteins are Cytotoxic to HeLa but not to SiHa Cervical Cancer Cells. Current pharmaceutical biotechnology 20, 1018-1027.

Montezano DG, Hunt TE, Specht A, Luz PMC and Peterson JA, 2019. Survival and Development of Striacosta albicosta (Smith) (Lepidoptera: Noctuidae) Immature Stages on Dry Beans, non-Bt, Cry1F, and Vip3A Maize. Insects 10, 11.

Morshita M, 2019. High-dose/Refuge Strategy for Insect Resistance to Bt Crops. Japanese Journal of Applied Entomology and Zoology 63, 29-38.

Moscardini VF, Marques LH, Santos AC, Rossetto J, Silva O, Rampazzo PE and Castro BA, 2020. Efficacy of Bacillus thuringiensis (Bt) maize expressing Cry1F, Cry1A.105, Cry2Ab2 and Vip3Aa20 proteins to manage the fall armyworm (Lepidoptera: Noctuidae) in Brazil. Crop Protection 137, 8.

Muralimohan N, Saini RP, Kesiraju K, Pattanayak D, Kumar PA, Kasturi K and Sreevathsa R, 2020. Molecular stacking of two codon-modified genes encoding Bt insecticidal proteins, Cry1AcF and Cry2Aa for management of resistance development in Helicoverpa armigera. Journal of Plant Biochemistry and Biotechnology 29, 518-527.

Muraro DS, Garlet CG, Godoy DN, Cossa GE, Rodrigues GLD, Stacke RF, Medeiros SLP, Guedes JVC and Bernardi O, 2019. Laboratory and field survival of Spodoptera frugiperda (Lepidoptera: Noctuidae) on Bt and non-Bt maize and its susceptibility to insecticides. Pest Management Science 75, 2202-2210.

Murua MG, Vera MA, Michel A, Casmuz AS, Fatoretto J and Gastaminza G, 2019. Performance of Field-Collected Spodoptera frugiperda (Lepidoptera: Noctuidae) Strains Exposed to Different Transgenic and Refuge Maize Hybrids in Argentina. Journal of Insect Science 19, 7.

Niu L, Liu F, Zhang S, Luo JY, Zhang LJ, Ji JC, Gao XK, Ma WH and Cui JJ, 2020. Transgenic insect-resistant Bt cotton expressing Cry1Ac/CpTI does not affect the mirid bug Apolygus lucorum. Environmental Pollution 264, 9.

Niz JM, Salvador R, Ferrelli ML, de Cap AS, Romanowski V and Berretta MF, 2020. Genetic variants in Argentinean isolates of Spodoptera frugiperda Multiple Nucleopolyhedrovirus. Virus genes 56, 401-405.

Olivi BM, Gore J, Musser FM, Catchot AL and Cook DR, 2019. Impact of Simulated Corn Earworm (Lepidoptera: Noctuidae) Kernel Feeding on Field Corn Yield. Journal of Economic Entomology 112, 2193-2198.

Pan JG, Lv X, Jin DC, Bai ZH, Qi HY, Zhang HX and Zhuang GQ, 2019. Developmental stage has a greater effect than Cry1Ac expression in transgenic cotton on the phyllosphere mycobiome. Canadian journal of microbiology 65, 116-125.

Pan Y, Dong Y, Wang RX and Yang MS, 2019. Generation of a promising universal RNAi vector system to control plant pests. Acta Physiologiae Plantarum 41, 12.

Pande R, Shah V and Verma P, 2019. First report on identification of volatiles from egg and larval frass of Indian strain of the American bollworm Helicoverpa armigera (Hubner). African Entomology 27, 403-409.

Pandey SP, Singh AP, Srivastava S, Chandrashekar K and Sane AP, 2019. A strong early acting wound-inducible promoter, RbPCD1pro, activates cryIAc expression within minutes of wounding to impart efficient protection against insects. Plant Biotechnology Journal 17, 1458-1470.

Park D, Choi IY and Kim NS, 2020. Detection of mPing mobilization in transgenic rice plants. Genes & genomics 42, 47-54.

Peng Q, Yu QY and Song FP, 2019. <bold>Expression ofcrygenes inBacillus thuringiensisbiotechnology</bold>. Applied Microbiology and Biotechnology 103, 1617-1626.

Pinos D, Martinez-Solis M, Herrero S, Ferre J and Hernandez-Martinez P, 2019. The Spodoptera exigua ABCC2 Acts as a Cry1A Receptor Independently of its Nucleotide Binding Domain II. Toxins 11, 13.

Pinos D, Chakroun M, Millan-Leiva A, Jurat-Fuentes JL, Wright DJ, Hernandez-Martinez P and Ferre J, 2020. Reduced Membrane-Bound Alkaline Phosphatase Does Not Affect Binding of Vip3Aa in aHeliothis virescensResistant Colony. Toxins 12, 12.

Portilla M, Blanco CA, Arias R and Zhu YC, 2020. Effect of Two Bacillus thuringiensis Proteins on Development of the Fall Armyworm after Seven-Day Exposure. Southwestern Entomologist 45, 389-403.

Prodhan MZH, Shirale DK, Islam MZ, Hossain MJ, Paranjape V and Shelton AM, 2019. Susceptibility of Field Populations of Eggplant Fruit and Shoot Borer (Leucinodes orbonalis Guenee) to Cry1Ac, the Protein Expressed in Bt Eggplant (Solanum melongena L.) in Bangladesh. Insects 10, 9.

Qamar Z, Tariq M, Rehman T, Iqbal MS, Sarwar MB, Sharif MN, Hassan Z, Ahmad A, Zahra A, Latif A, Rashid B, Zaidi MA, Tabassum B, Hassan S, Baksh A, Javaid M,

Akram S, Azam S, Naz F, Ahmed S, Bajwa KS, Awan MF, Shahid N, Ali A, Riaz S, Bashir B, Sadiq K, Kokab QU, Yousaf I, Farooq AM, Javed MA, Rahman ZU, Saleem MZ, Yasmin A, Bhatti MU, Arif U, Bashir K, Jamal A, Butt SJ, Arif A, Ahmad I, Rao AQ, Haider MS, Malik TH and Nasir IA, 2019. Trackable CEMB-Klean Cotton Transgenic Technology: Afforadable Climate Neutral Agri-biotech Industrialization for Developing Countries. Advancements in Life Sciences 6, 131-138.

Qi LL, Qiu XF, Yang SS, Li R, Wu BB, Cao XM, He T, Ding XZ, Xia LQ and Sun YJ, 2020. Cry1Ac Protoxin and Its Activated Toxin from Bacillus thuringiensis Act Differentially during the Pathogenic Process. Journal of Agricultural and Food Chemistry 68, 5816-5824.

Qin D, Liu XY, Miceli C, Zhang Q and Wang PW, 2019. Soybean plants expressing the Bacillus thuringiensis cry8-like gene show resistance to Holotrichia parallela. Bmc Biotechnology 19, 12.

Qiu L, Sun Y, Jiang Z, Yang P, Liu H, Zhou H, Wang X, Zhang W, Lin Y and Ma W, 2019. The midgut V-ATPase subunit A gene is associated with toxicity to crystal 2Aa and crystal 1Ca-expressing transgenic rice in Chilo suppressalis. Insect Molecular Biology 28, 520-527.

Qiu XF, Lu XQ, Ren XM, Li R, Wu BB, Yang SS, Qi LL, Mo XT, Ding XZ, Xia LQ and Sun YJ, 2019. Solubility enhancement of Cry2Aa crystal through carboxy-terminal extension and synergism between the chimeric protein and Cry1Ac. Applied Microbiology and Biotechnology 103, 2243-2250.

Rabelo MM, Matos JML, Orozco-Restrepo SM, Paula-Moraes SV and Pereira EJG, 2020. Like Parents, Like Offspring? Susceptibility to Bt Toxins, Development on Dual-Gene Bt Cotton, and Parental Effect of Cry1Ac on a Nontarget Lepidopteran Pest. Journal of Economic Entomology 113, 1234-1242.

Rabelo MM, Matos JML, Santos-Amaya OF, Franca JC, Goncalves J, Paula-Moraes SV, Guedes RNC and Pereira EJG, 2020. Bt-toxin susceptibility and hormesis-like response in the invasive southern armyworm (Spodoptera eridania). Crop Protection 132, 7.

Ramos LN, Souza NOS and Vilela MS, 2020. AGRONOMIC PARAMETERS AND MORPHO-AGRONOMIC CHARACTERISTICS OF GENETICALLY MODIFIED MAIZE HYBRIDS COMPARED TO CONVENTIONAL MAIZE HYBRIDS. Bioscience Journal 36, 1156-1166.

Raper TB, Butler SA, Denton S, Steckel LE and Hayes RM, 2019. LibertyLink (R), WideStrike (R) and XtendFlex (R) Tolerance to Late Postemergence Applications of Glufosinate and S-Metolachlor. Journal of Cotton Science 23, 262-269.

Raszick TJ, Suh CPC, Dickens CM and Sword GA, Genome-wide markers reveal temporal instability of local population genetic structure in the cotton fleahopper, Pseudatomoscelis seriatus (Hemiptera: Miridae). Pest Management Science 9.

Raszick TJ, Suh CPC, Dickens CM and Sword GA, 2020. Genome-wide markers reveal temporal instability of local population genetic structure in the cotton fleahopper, Pseudatomoscelis seriatus (Hemiptera: Miridae). Pest Management Science 76, 324-332.

Razaq M, Mensah R and Athar HUR, 2020. Insect Pest Management in Cotton. John Wiley & Sons Ltd, Chichester, 85-107

Reay-Jones FRF, 2019. Pest Status and Management of Corn Earworm (Lepidoptera: Noctuidae) in Field Corn in the United States. Journal of Integrated Pest Management 10, 9.

Rendon D, Taylor PW, Wilder SM and Whitehouse MEA, 2019. Does prey encounter and nutrient content affect prey selection in wolf spiders inhabiting Bt cotton fields? Plos One 14, 15.

Reyaz AL, Balakrishnan N and Udayasuriyan V, 2019. Genome sequencing of Bacillus thuringiensis isolate T414 toxic to pink bollworm (Pectinophora gossypiella Saunders) and its insecticidal genes. Microbial Pathogenesis 134, 6.

Riaz S, Nasir IA, Bhatti MU, Adeyinka OS, Toufiq N, Yousaf I and Tabassum B, 2020. Resistance to Chilo infuscatellus (Lepidoptera: Pyraloidea) in transgenic lines of sugarcane expressing Bacillus thuringiensis derived Vip3A protein. Molecular Biology Reports 47, 2649-2658.

Rivero-Borja M, Rodriguez-Maciel JC, Gutierrez JAU, Silva-Aguayo G, Chandrasena DI, Felix-Bermudez NC and Storer NP, 2020. Baseline of Susceptibility to the Cry1F Protein in Mexican Populations of Fall Armyworm. Journal of Economic Entomology 113, 390-398.

Rodrigues-Silva N, Canuto AF, Oliveira DF, Teixeira AF, Santos-Amaya OF, Picanco MC and Pereira EJG, 2019. Negative cross-resistance between structurally different Bacillus thuringiensis toxins may favor resistance management of soybean looper in transgenic Bt cultivars. Scientific Reports 9, 9.

Romeis J, Naranjo SE, Meissle M and Shelton AM, 2019. Genetically engineered crops help support conservation biological control. Biological Control 130, 136-154.

Rozadilla G, Cabrera NA, Virla EG, Greco NM and McCarthy CB, 2020. Gut microbiota of Spodoptera frugiperda (JE Smith) larvae as revealed by metatranscriptomic analysis. Journal of Applied Entomology 144, 351-363.

Rupula K, Kosuri T, Gul MZ, Sharma B and Beedu SR, 2019. Immuno-analytical method development for detection of transgenic Cry1Ac protein and its validation. Journal of the Science of Food and Agriculture 99, 6903-6910.

Saleem MJ, Arshad M, Ahmed S and Sahi ST, 2019. VARIATION IN SUSCEPTIBILITY OF Helicoverpa armigera (LEPIDOPTERA: NOCTUIDAE) TO CRY1AC TOXIN. Pakistan Journal of Agricultural Sciences 56, 415-420.

Salisu IB, Shahid AA, Yaqoob A, Rao AQ and Husnain T, 2019. Effect of dietary supplementation of recombinant Cry and Cp4 epsps proteins on haematological indices of growing rabbits. Journal of animal physiology and animal nutrition 103, 305-316.

Sereno ML, Infante S, Cheavegatti-Gianotto A, Hjelle K, Lirette R, Cutri L, Rocha MS, Hjelle J and Cullis C, 2020. Evaluation of the effects of sugarcane processing on the presence of GM DNA and protein in sugar. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 11, 171-183.

Shabbir MZ, Zhang TT, Prabu S, Wang YQ, Wan ZY, Bravo A, Soberon M and He KL, 2020. Identification of Cry1Ah-binding proteins through pull down and gene expression analysis in Cry1Ah-resistant and susceptible strains of Ostrinia furnacalis. Pesticide Biochemistry and Physiology 163, 200-208.

Shahid MI, Arshad M, ul Hasan M and Khan MA, 2019. Efficacy of Cry1Ac toxin from Bacillus thuringiensis against the beet armyworm, Spodoptera exigua (Hubner) (Lepidoptera: Noctuidae). Egyptian Journal of Biological Pest Control 29, 5.

Shahid AA, Salisu IB, Yaqoob A, Rao AQ, Ullah I and Husnain T, 2020. Assessing the fate of recombinant plant DNA in rabbit's tissues fed genetically modified cotton. Journal of animal physiology and animal nutrition 104, 343-351.

Shelton AM, Hossain MJ, Paranjape V, Prodhan MZH, Azad AK, Majumder R, Sarwer SH and Hossain MA, 2019. Bt Brinjal in Bangladesh: The First Genetically Engineered

Food Crop in a Developing Country. Cold Spring Harbor perspectives in biology 11, 13.

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.

Siddiqui HA, Asif M, Asad S, Naqvi RZ, Ajaz S, Umer N, Anjum N, Rouf I, Sarwar M, Arshad M, Amin I, Saeed M, Mukhtar Z, Bashir A and Mansoor S, 2019. Development and evaluation of double gene transgenic cotton lines expressing Cry toxins for protection against chewing insect pests. Scientific Reports 9, 7.

Silva LB, Maggioni K, Ferreira RH, Silva AF, Pavan BE and Lopes GN, 2019. Survival and nutritional indexes of Spodoptera frugiperda (J.E. Smith, 1797) (Lepidoptera: Noctuidae) maintained in Bt maize for five generations. Revista Brasileira De Ciencias Agrarias-Agraria 14, 8.

Singh M, Randhawa G, Bhoge RK, Singh S, Kak A and Sangwan O, Monitoring Adventitious Presence of Transgenes in Cotton Collections from Genebank and Experimental Plots: Ensuring GM-Free Conservation and Cultivation of Genetic Resources. Agricultural Research 8.

Sivamani E, Nalapalli S, Prairie A, Bradley D, Richbourg L, Strebe T, Liebler T, Wang DL and Que QD, 2019. A study on optimization of pat gene expression cassette for maize transformation. Molecular Biology Reports 46, 3009-3017.

Smith JL, Farhan Y and Schaafsma AW, 2019. Practical Resistance of Ostrinia nubilalis (Lepidoptera: Crambidae) to Cry1F Bacillus thuringiensis maize discovered in Nova Scotia, Canada. Scientific Reports 9, 10.

Song XY, Chang L, Reddy GVP, Zhang L, Fan CM and Wang BF, 2019. Use of Taxonomic and Trait-Based Approaches to Evaluate the Effects of Transgenic Cry1Ac Corn on the Community Characteristics of Soil Collembola. Environmental Entomology 48, 263-269.

Song YY, Liu JW and Chen FJ, 2020. Elevated CO2 not increased temperature has specific effects on soil nematode community either with planting of transgenic Bt rice or non-Bt rice. Peerj 8, 16.

Song YY, Liu JW, Li LK, Liu MQ, Chen XY and Chen FJ, 2020. Evaluating the effects of transgenic Bt rice cultivation on soil stability. Environmental Science and Pollution Research 27, 17412-17419.

Song YY, Liu RY, Wang MF, Liu MQ, Liu XH, Ge F and Chen FJ, 2020. Effects of transgenic Bt rice lines with single Cry1Ab and fused Cry1Ab/Cry1Ac on the abundance dynamics and community diversity of soil mites. Archives of Agronomy and Soil Science 66, 586-599.

Souza CSF, Silveira LCP, Pitta RM, Waquil JM, Pereira EJG and Mendes SM, 2019. Response of field populations and Cry-resistant strains of fall armyworm to Bt maize hybrids and Bt-based bioinsecticides. Crop Protection 120, 1-6.

Srikanth P, Mercy D, Ann M and Sam AM, 2019. Optimization of spacing and refuge strategy for improved Cr1Ac expression level in Bt cotton. Research Journal of Biotechnology 14, 45-52.

St Clair CR, Head GP and Gassmann AJ, 2020. Western corn rootworm abundance, injury to corn, and resistance to Cry3Bb1 in the local landscape of previous problem fields. Plos One 15, 22.

Su HH, Jiang T, Sun Y, Gu HJ, Wu JJ and Yang YZ, 2020. Effect of three insect-resistant maizes expressing Cry1le, Cry1Ab/Cry2Aj and Cry1Ab on the growth and

development of armyworm Mythimna separata (Walker). Journal of Integrative Agriculture 19, 1842-1849.

Sun YJ, Yang P, Jin HH, Liu H, Zhou H, Qiu L, Lin YJ and Ma WH, 2020. Knockdown of the aminopeptidase N genes decreases susceptibility of Chilo suppressalis larvae to Cry1Ab/CrylAc and Cry1Ca. Pesticide Biochemistry and Physiology 162, 36-42.

Syed T, Askari M, Meng ZG, Li YY, Abid MA, Wei YX, Guo SD, Liang CZ and Zhang R, 2020. Current Insights on Vegetative Insecticidal Proteins (Vip) as Next Generation Pest Killers. Toxins 12, 24.

Tabashnik BE and Carriere Y, 2019. Global Patterns of Resistance to Bt Crops Highlighting Pink Bollworm in the United States, China, and India. Journal of Economic Entomology 112, 2513-2523.

Tabashnik BE and Carriere Y, 2020. Evaluating Cross-resistance Between Vip and Cry Toxins of Bacillus thuringiensis. Journal of Economic Entomology 113, 553-561.

Takahashi TA, Nishimura G, Carneiro E and Foerster LA, 2019. First record of Peridroma saucia Hubner (Lepidoptera: Noctuidae) in transgenic soybeans. Revista Brasileira De Entomologia 63, 199-201.

Talakayala A, Katta S and Garladinne M, 2020. Genetic engineering of crops for insect resistance: An overview. Journal of Biosciences 45, 12.

Tang QF, Yang ZP, Han RR, Zhang Y, Shen C and Wang J, 2019. No Effect of Bt-transgenic Rice on the Tritrophic Interaction of the Stored Rice, the Maize Weevil Sitophilus Zeamais and the Parasitoid Wasp Theocolax elegans. Scientific Reports 9, 7.

Tessnow AE, Behmer ST and Sword GA, Protein-carbohydrate regulation and nutritionally mediated responses to Bt are affected by caterpillar population history. Pest Management Science 8.

Umer N, Naqvi RZ, Rauf I, Anjum N, Keen PR, Van Eck J, Jander G and Asif M, 2020. Expression of Pinellia ternata leaf agglutinin under rolC promoter confers resistance against a phytophagous sap sucking aphid, Myzus persicae. Electronic Journal of Biotechnology 47, 72-82.

Vassallo CN, Bunge FF, Signorini AM, Valverde-Garcia P, Rule D and Babcock J, 2019. Monitoring the Evolution of Resistance in Spodoptera frugiperda (Lepidoptera: Noctuidae) to the Cry1F Protein in Argentina. Journal of Economic Entomology 112, 1838-1844.

Viktorov AG, 2019. Genetic Engineering-Based Modern Approaches to Enhance Crop Resistance to Pests. Russian Journal of Plant Physiology 66, 1-9.

Vonzun S, Messmer MM, Boller T, Shrivas Y, Patil SS and Riar A, 2019. Extent of Bollworm and Sucking Pest Damage on Modern and Traditional Cotton Species and Potential for Breeding in Organic Cotton. Sustainability 11, 12.

Wang BJ, Wang YN, Wei JZ, Liu C, Chen L, Khaing MM and Liang GM, 2019. Polycalin is involved in the action mechanism of Cry2Aa toxin in Helicoverpa armigera (Hubner). Journal of Integrative Agriculture 18, 627-635.

Wang JD, Zhang JS, Guo YF, Chen LF, Wang FL, Huang MT, Gao SJ and Wang R, 2019. Molecular cloning, characterization, and expression profiling analysis of Cry toxin receptor genes from sugarcane shoot borer Chilo infuscatellus (Snellen). Pesticide Biochemistry and Physiology 157, 186-195.

Wang L, Ma YM, Guo XQ, Wan P, Liu KY, Cong SB, Wang JT, Xu D, Xiao YT, Li XC, Tabashnik BE and Wu KM, 2019. Pink Bollworm Resistance to Bt Toxin Cry1Ac Associated with an Insertion in Cadherin Exon 20. Toxins 11, 13.

Wang L, Wang JT, Ma YM, Wan P, Liu KY, Cong SB, Xiao YT, Xu D, Wu KM, Fabrick

JA, Li XC and Tabashnik BE, 2019. Transposon insertion causes cadherin mis-splicing and confers resistance to Bt cotton in pink bollworm from China. Scientific Reports 9, 10.

Wang PP, Ma JH, Head GP, Xia DP, Li J, Wang HQ, Yang ML, Xie ZM, Zalucki MP and Lu ZZ, 2019. Susceptibility of Helicoverpa armigera to two Bt toxins, Cry1Ac and Cry2Ab, in northwestern China: toward developing an IRM strategy. Journal of Pest Science 92, 923-931.

Wang Y, Zhang X, Xie YJ, Wu AH, Zai XM and Liu XJ, 2019. High-affinity phage-displayed peptide as a recognition probe for the detection of Cry2Ad2-3. International Journal of Biological Macromolecules 137, 562-567.

Wang YF, Wang JL, Fu XR, Nageotte JR, Silverman J, Bretsnyder EC, Chen DQ, Rydel TJ, Bean GJ, Li KS, Kraft E, Gowda A, Nance A, Moore RG, Pleau MJ, Milligan JS, Anderson HM, Asiimwe P, Evans A, Moar WJ, Martinelli S, Head GP, Haas JA, Baum JA, Yang F, Kerns DL and Jerga A, 2019. Bacillus thuringiensis Cry1Da_7 and Cry1B.868 Protein Interactions with Novel Receptors Allow Control of Resistant Fall Armyworms, Spodoptera frugiperda (JE Smith). Applied and Environmental Microbiology 85, 15.

Wang YQ, Quan YD, Yang J, Shu CL, Wang ZY, Zhang J, Gatehouse AMR, Tabashnik BE and He KL, 2019. Evolution of Asian Corn Borer Resistance to Bt Toxins Used Singly or in Pairs. Toxins 11, 9.

Wang BJ, Wei JZ, Wang YN, Chen L and Liang GM, 2020. Polycalin is involved in the toxicity and resistance to Cry1Ac toxin in Helicoverpa armigera (Hubner). Archives of Insect Biochemistry and Physiology 104, 12.

Wang J, Ma HH, Zhao S, Huang JL, Yang YH, Tabashnik BE and Wu YD, 2020. Functional redundancy of two ABC transporter proteins in mediating toxicity of Bacillus thuringiensis to cotton bollworm. PLoS Pathogens 16, 15.

Wang J, Zuo YY, Li LL, Wang H, Liu SY, Yang YH and Wu YD, 2020. Knockout of three aminopeptidase N genes does not affect susceptibility of Helicoverpa armigera larvae to Bacillus thuringiensis Cry1A and Cry2A toxins. Insect Science 27, 440-448.

Wang JT, Xu D, Wang L, Cong SB, Wan P, Lei CL, Fabrick JA, Li XC, Tabashnik BE and Wu KM, 2020. Bt resistance alleles in field populations of pink bollworm from China: Similarities with the United States and decreased frequency from 2012 to 2015. Pest Management Science 76, 527-533.

Wang SH and Wang P, 2020. Functional redundancy of structural proteins of the peritrophic membrane in Trichoplusia ni. Insect Biochemistry and Molecular Biology 125, 10.

Wang WJ, Cai WL, Wang ZJ, Zhao J and Hua HX, 2020. A new method for evaluating the effects of insecticidal proteins expressed by transgenic plants on ectoparasitoid of target pest. Environmental Science and Pollution Research 27, 29983-29992.

Wang XL, Xu YJ, Huang JL, Jin WZ, Yang YH and Wu YD, 2020. CRISPR-Mediated Knockout of the ABCC2 Gene in Ostrinia furnacalis Confers High-Level Resistance to the Bacillus thuringiensis Cry1Fa Toxin. Toxins 12, 12.

Wang ZJ, Cai WL, Wang WJ, Zhao J, Li YF, Zou YL, Elgizawy KK and Hua HX, 2020. Assessing the effects of Cry2Aa protein on Habrobracon hebetor (Hymenoptera: Braconidae), a parasitoid of Indian meal moth, Plodia interpunctella (lepidoptera: Pyralidae). Ecotoxicology and Environmental Safety 194, 7.

Wei J, Zhang M, Liang G and Li X, 2019. Alkaline phosphatase 2 is a functional receptor of Cry1Ac but not Cry2Ab in Helicoverpa zea. Insect Molecular Biology 28, 372-379.

Wei JZ, Zhang YL and An SH, 2019. The progress in insect cross-resistance among Bacillus thuringiensis toxins. Archives of Insect Biochemistry and Physiology 102, 15.

Wei W, Pan S, Ma YM, Xiao YT, Yang YB, He SJ, Bravo A, Soberon M and Liu KY, 2020. GATAe transcription factor is involved in Bacillus thuringiensis Cry1Ac toxin receptor gene expression inducing toxin susceptibility. Insect Biochemistry and Molecular Biology 118, 9.

Wu AJ, Chapman K, Sathischandra S, Massengill J, Araujo R, Soria M, Bugas M, Bishop Z, Haas C, Holliday B, Cisneros K, Lor J, Canez C, New S, Mackie S, Ghoshal D, Privalle L, Hunst P and Pallett K, 2019. GHB614 x T304-40 x GHB119 x COT102 Cotton: Protein Expression Analyses of Field-Grown Samples. Journal of Agricultural and Food Chemistry 67, 275-281.

Xiang Z, Feng TQ, Chen Z, Xin MY, Hua WC, Yuan C and Hua CD, 2019. Exogenous Hormones Affect Bt Protein Content of Two Bt Cotton Cultivars. Agronomy Journal 111, 3076-3083.

Xiao YT and Wu KM, 2019. Recent progress on the interaction between insects and Bacillus thuringiensis crops. Philosophical Transactions of the Royal Society B-Biological Sciences 374, 15.

Xie XW, Cui ZF, Wang YA, Wang YY, Cao FQ, Romeis J, Peng YF and Li YH, 2019. Bacillus thuringiensis Maize Expressing a Fusion Gene Cry1Ab/Cry1AcZM Does Not Harm Valued Pollen Feeders. Toxins 11, 13.

Xing YJ, Qin ZF, Feng MY, Li AM, Zhang L, Wang Y, Dong XH, Zhang YX, Tan SQ and Shi WP, 2019. The impact of Bt maize expressing the Cry1Ac protein on non-target arthropods. Environmental Science and Pollution Research 26, 5814-5819.

Xu J, Wang ZY, Wang YF, Ma HH, Zhu H, Liu J, Zhou Y, Deng XL and Zhou XM, 2020. ABCC2 participates in the resistance of Plutella xylostella to chemical insecticides. Pesticide Biochemistry and Physiology 162, 52-59.

Yan X, Lu J, Ren M, He Y, Wang Y, Wang Z and He K, 2020. Insecticidal Activity of 11 Bt toxins and 3 Transgenic Maize Events Expressing Vip3Aa19 to Black Cutworm, Agrotis ipsilon (Hufnagel). Insects 11, 10.

Yang F, Head GP, Price PA, Gonzalez JCS and Kerns DL, Inheritance of Bacillus thuringiensis Cry2Ab2 protein resistance in Helicoverpa zea (Lepidoptera: Noctuidae). Pest Management Science 9.

Yang F, Gonzalez JCS, Williams J, Cook DC, Gilreath RT and Kerns DL, 2019. Occurrence and Ear Damage of Helicoverpa zea on Transgenic Bacillus thuringiensis Maize in the Field in Texas, US and Its Susceptibility to Vip3A Protein. Toxins 11, 13.

Yang XW, Chen WB, Song XZ, Ma XL, Cotto-Rivera RO, Kain W, Chu HN, Chen YR, Fei ZJ and Wang P, 2019. Mutation of ABC transporter ABCA2 confers resistance to Bt toxin Cry2Ab in Trichoplusia ni. Insect Biochemistry and Molecular Biology 112, 11.

Yang F, Gonzalez JCS, Little N, Reisig D, Payne G, Dos Santos RF, Jurat-Fuentes JL, Kurtz R and Kerns DL, 2020. First documentation of major Vip3Aa resistance alleles in field populations of Helicoverpa zea (Boddie) (Lepidoptera: Noctuidae) in Texas, USA. Scientific Reports 10, 8.

Yang YJ, Xu H, Wu ZH and Lu ZX, 2020. pH influences the profiles of midgut extracts in Cnaphalocrocis medinalis (Guenee) and its degradation of activated Cry toxins. Journal of Integrative Agriculture 19, 775-784.

Yaqoob A, Shahid AA, Salisu IB, Azam S, Ahmed M and Rao AQ, 2019. Effects of Cry toxins on non-target soil bacteria during a 2-year follow up study. Spanish Journal of Agricultural Research 17, 8.

Yu S, Li S, Li HT, Liu RM and Gao JG, 2020. Bacillus thuringiensis Vip3Aa and Vip3Ad Chimeric Proteins Improve their Insecticidal Activity against Lepidopteran Insects. International Journal of Agriculture and Biology 23, 326-332.

Yunus FUN, Raza G, Makhdoom R and Zaheer H, 2019. Genetic improvement of Bacillus thuringiensis against the cotton bollworm, Earias vitella (Fab.) (Lepidoptera: Noctuidae), to improve the cotton yield in Pakistan. Egyptian Journal of Biological Pest Control 29, 6.

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.

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.

Zhang DD, Xiao YT, Chen WB, Lu YH and Wu KM, 2019. Field monitoring of Helicoverpa armigera (Lepidoptera: Noctuidae) Cry1Ac insecticidal protein resistance in China (2005-2017). Pest Management Science 75, 753-759.

Zhang M, Wei JZ, Ni XZ, Zhang J, Jurat-Fuentes JL, Fabrick JA, Carriere Y, Tabashnik BE and Li XC, 2019. Decreased Cry1Ac activation by midgut proteases associated with Cry1Ac resistance in Helicoverpa zea. Pest Management Science 75, 1099-1106.

Zhang MJ, Feng MC, Xiao LJ, Song XY, Guangwei D and Yang WD, 2019. Persistence of Cry1Ac Protein from Transgenic Bt Cotton Cultivation and Residue Returning in Fields and Its Effect on Functional Diversity of Soil Microbial Communities. Pedosphere 29, 114-122.

Zhang JF, Jin MH, Yang YC, Liu LL, Yang YB, Gomez I, Bravo A, Soberon M, Xiao YT and Liu KY, 2020. The Cadherin Protein Is Not Involved in Susceptibility toBacillus thuringiensisCry1Ab or Cry1Fa Toxins inSpodoptera frugiperda. Toxins 12, 13.

Zhao CC, Wu LK, Luo JY, Niu L, Wang CP, Zhu XZ, Wang L, Zhao P, Zhang S and Cui JJ, 2020. Bt, Not a Threat toPropylea japonica. Frontiers in Physiology 11, 12.

Zhao XF, 2020. Progress in understanding hormonal regulation during the postembryonic development of Helicoverpa armigera. Journal of Integrative Agriculture 19, 1417-1428.

Zhao Y, Yun YL and Peng Y, 2020. Bacillus thuringiensis protein Vip3Aa does not harm the predator Propylea japonica: A toxicological, histopathological, biochemical and molecular analysis. Ecotoxicology and Environmental Safety 192, 5.

Zhou LQ, Alphey N, Walker AS, Travers LM, Morrison NI, Bonsall MB and Raymond B, 2019. The application of self-limiting transgenic insects in managing resistance in experimental metapopulations. Journal of Applied Ecology 56, 688-698.

Zhou MY, Li YB, Cui Q, Abidallha E, Chen Y and Chen DH, 2019. Square Insecticidal Protein Concentration Relate to its Biomass in Bt Cotton. Agronomy Journal 111, 467-472.

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.

Zhou H, Hu W, Huang Q, Abouzaid M, Jin H, Sun Y, Qiu L, Zhang W, Lin Y and Ma W, 2020. Knockdown of cadherin genes decreases susceptibility of Chilo suppressalis larvae to Bacillus thuringiensis produced Crystal toxins. Insect Molecular Biology 29, 301-308.

Zhou JL, Guo ZJ, Kang S, Qin JY, Gong LJ, Sun D, Guo L, Zhu LH, Bai Y, Zhang ZZ, Zhou XM and Zhang YJ, 2020. Reduced expression of the P-glycoprotein gene PxABCB1 is linked to resistance to Bacillus thuringiensis Cry1Ac toxin in Plutella xylostella (L.). Pest Management Science 76, 712-720.

Zhou XL, Dong Y, Zhang Q, Xiao DD, Yang MS and Wang JM, 2020. Expression of Multiple Exogenous Insect Resistance and Salt Tolerance Genes inPopulus nigraL. Frontiers in Plant Science 11, 13.

Zhu CQ, Niu Y, Zhou YW, Guo JG, Head GP, Price PA, Wen XJ and Huang FN, 2019. Survival and effective dominance level of a Cry1A.105/Cry2Ab2-dual gene resistant population of Spodoptera frugiperda (JE Smith) on common pyramided Bt corn traits. Crop Protection 115, 84-91.

Zhu B, Sun X, Nie XM, Liang P and Gao XW, 2020. MicroRNA-998-3p contributes to Cry1Ac-resistance by targeting ABCC2 in lepidopteran insects. Insect Biochemistry and Molecular Biology 117, 9.

Zubair M, Latif A, Rao AQ, Azam S, Shahid N, Samiullah TR, Yasmeen A, Shahid AA, Nasir IA and Husnain T, 2019. A Combinational Approach of Enhanced Methanol Production and Double Bt Genes for Broad Spectrum Insect Resistance in Transgenic Cotton. Molecular biotechnology 61, 663-673.

2. <u>Entries retrieved using CAB Abstracts</u>

Abdelgaffar HM, Oppert C, Sun X, Monserrate J and Jurat-Fuentes JL, 2019. Differential heliothine susceptibility to Cry1Ac associated with gut proteolytic activity. Pesticide Biochemistry and Physiology 153, 1-8.

Ai X, Ren S, Liu N, Huang L and Liu X, 2019. Transgenic tobacco expressing dsRNA of the arginine kinase gene exhibits enhanced resistance against Helicoverpa armigera. Bulletin of Insectology 72, 115-124.

Akhtar ZR, Amer R, Muhammad S, Asad A, Irfan A, Bushra S and Mansoor ul H, 2020. Characterizing the mode of resistance inheritance and cross resistance in pink bollworm against Cry1Ac toxin and organophosphate pesticides in Pakistan. Pakistan Journal of Agricultural Sciences 57, 1101-1106.

Amina Y, Shahid AA, Salisu IB, Saira A, Mukhtar A and Rao AQ, 2019. Effects of Cry toxins on non-target soil bacteria during a 2-year follow up study. Spanish Journal of Agricultural Research 17.

Anjum R, Baloch MJ, Baloch GM and Chachar Q, 2019. Significance of cross combinations for developing Bt cotton varieties for optimum gene (Cry1Ac) expression level required for better bollworm control. JAPS, Journal of Animal and Plant Sciences 29, 531-538.

Bahar MH, Stanley J, Backhouse D, Mensah R, Socorro Ad and Gregg P, 2019. Survival of Helicoverpa armigera larvae on and Bt toxin expression in various parts of transgenic Bt cotton (Bollgard II) plants. Entomologia Experimentalis Et Applicata 167, 415-423.

Baker GH, Tann CR, Verwey P and Lisle L, 2019. Do the plant host origins of Helicoverpa (Lepidoptera: Noctuidae) moth populations reflect the agricultural landscapes within which they are caught? Bulletin of Entomological Research 109, 1-14.

Bally J, Fishilevich E, Doran RL, Lee K, Campos SBd, German MA, Narva KE and Waterhouse PM, 2020. Plin-amiR, a pre-microRNA-based technology for controlling herbivorous insect pests. Plant Biotechnology Journal 18, 1925-1932.

Bel Y, Zack M, Narva K and Escriche B, 2019. Specific binding of Bacillus thuringiensis Cry1Ea toxin, and Cry1Ac and Cry1Fa competition analyses in Anticarsia gemmatalis and Chrysodeixis includens. Scientific Reports 9, 18201.

Bilbo TR, Reay-Jones FPF, Reisig DD and Greene JK, 2019. Susceptibility of corn earworm (Lepidoptera: Noctuidae) to Cry1A.105 and Cry2Ab2 in North and South Carolina. Journal of Economic Entomology 112, 1845-1857.

Bilbo TR, Reay-Jones FPF, Reisig DD, Greene JK and Turnbull MW, 2019. Development, survival, and feeding behavior of Helicoverpa zea (Lepidoptera: Noctuidae) relative to Bt protein concentrations in corn ear tissues. Plos One 14, e0221343.

Botha AS, Erasmus A, Plessis Hd and Berg Jvd, 2019. Efficacy of Bt maize for control of Spodoptera frugiperda (Lepidoptera: Noctuidae) in South Africa. Journal of Economic Entomology 112, 1260-1266.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Helicoverpa zea (Lepidoptera: Noctuidae) oviposition and larval vertical distribution in Bt cotton under different levels of nitrogen and irrigation. Journal of Economic Entomology 112, 1237-1250.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Helicoverpa zea (Lepidoptera: Noctuidae) preference for plant structures, and their location, within Bt cotton under different nitrogen and irrigation regimes. Journal of Economic Entomology 112, 1741-1751.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Development and dispersal of Helicoverpa zea (Lepidoptera: Noctuidae) on non-Bt and Bt pyramided cotton. Environmental Entomology 48, 465-477.

Carriere Y, Yelich AJ, Degain BA, Harpold VS, Unnithan GC, Kim JH, Mathew LG, Head GP, Rathore KS, Fabrick JA and Tabashnik BE, 2019. Gossypol in cottonseed increases the fitness cost of resistance to Bt cotton in pink bollworm. Crop Protection 126, 104914.

Chang M, Zhao D, Zhang Y, Xu C, Lu X and Guo W, 2019. In vitro binding characteristics of three kinds of Bt proteins in the midgut alkaline phosphatase HcALP1 of Bacillus thuringiensis. Acta Sericologica Sinica 331-337.

Chen Y, Li Y, Zhou M, Cai Z, Tambel LIM, Zhang X, Chen Y and Chen D, 2019. Nitrogen deficit decreases seed Cry1Ac endotoxin expression in Bt transgenic cotton. Plant Physiology and Biochemistry 141, 114-121.

Deng J, Wang Y, Yang F, Liu Y and Liu B, 2019. Persistence of insecticidal Cry toxins in Bt rice residues under field conditions estimated by biological and immunological assays. Science of the Total Environment 679, 45-51.

Devaki K, Murali Krishna T and Hari Prasad K, 2020. Diversity of Bacillus thuringiensis cry genes in soils of Andhra Pradesh, India. Indian Journal of Biochemistry & Biophysics 57, 471-480.

Dhanaraj AL, Willse AR and Kamath SP, 2019. Stability of expression of Cry1Ac and Cry2Ab2 proteins in Bollgard-II hybrids at different stages of crop growth in different genotypes across cropping seasons and multiple geographies. Transgenic Research 28, 33-50.

Ding R, Ma D, Uwais A, Wang D, Liu J, Xu Y, Li H, Li H and Pan H, 2019. Transgenic Cry1Ac cotton does not affect the development and fecundity of Chrysoperla carnea. Plos One 14, e0214668.

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

Dominguez-Mendez R, Alcantara-de la Cruz R, Rojano-Delgado AM, Silveira HMd, Portugal J, Cruz-Hipolito HE and Prado Rd, 2019. Stacked traits conferring multiple resistance to imazamox and glufosinate in soft wheat. Pest Management Science 75,

648-657.

Dong S, Liu Y, Zhang X, Xu C, Liu X and Zhang C, 2019. Development of an immunochromatographic assay for the specific detection of Bacillus thuringiensis (Bt) Cry1Ab toxin. Analytical biochemistry 567, 1-7.

Eghrari K, Brito AHd, Baldassi A, Balbuena TS, Fernandes OA and Moro GV, 2019. Homozygosis of Bt locus increases Bt protein expression and the control of Spodoptera frugiperda (Lepidoptera: Noctuidae) in maize hybrids. Crop Protection 124, 104871.

Eisenring M, Naranjo SE, Bacher S, Abbott A, Meissle M and Romeis J, 2019. Reduced caterpillar damage can benefit plant bugs in Bt cotton. Scientific Reports 9, 2727.

Elumalai S, Samson N, Prairie A, Bradley D, Richbourg L, Strebe T, Liebler T, Wang D and Que Q, 2019. A study on optimization of pat gene expression cassette for maize transformation. Molecular Biology Reports 46, 3009-3017.

Fernandes MG, Araujo RPd, Costa EN, Zangirolymo ACTA and Pereira RM, 2019. Influence of Cry1Ac toxin from Bt cotton on the soil microbiota. Journal of Agricultural Science (Toronto) 11, 364-380.

Fernandes MG, Costa EN, Dutra CC and Raizer J, 2019. Species richness and community composition of ants and beetles in Bt and non-Bt maize fields. Environmental Entomology 48, 1095-1103.

Figueiredo CS, Lemes ARN, Sebastiao I and Desiderio JA, 2019. Synergism of the Bacillus thuringiensis Cry1, Cry2, and Vip3 proteins in Spodoptera frugiperda control. Applied Biochemistry and Biotechnology 188, 798-809.

Funichello M, Fraga DF, Prado EP, Aguirre-Gil OJ and Busoli AC, 2019. Vertical distribution of crysodeixis includens (Lepidoptera: Noctuidae) in transgenic and conventional cotton cultivars

Distribuicao vertical de Crysodeixis includens (Lepidoptera: Noctuidae) em cultivar transgenica e convencional de algodoeiro. Revista de Ciencias Agroveterinarias 18, 150-153.

Gagandeep K, Guo J, Brown S, Head GP, Price PA, Paula-Moraes S, Ni X, Dimase M and Huang F, 2019. Field-evolved resistance of Helicoverpa zea (Boddie) to transgenic maize expressing pyramided Cry1A.105/Cry2Ab2 proteins in northeast Louisiana, the United States. Journal of Invertebrate Pathology 163, 11-20.

Gong L, Kang S, Zhou J, Sun D, Guo L, Qin J, Zhu L, Bai Y, Ye F, Akami M, Wu Q, Wang S, Xu B, Yang Z, Bravo A, Soberon M, Guo Z, Wen L and Zhang Y, 2020. Reduced expression of a novel midgut trypsin gene involved in protoxin activation correlates with Cry1Ac resistance in a laboratory-selected strain of Plutella xylostella (L.). Toxins 12.

Guo J, Yang F, Brown S, Kern D, Head GP, Price PA, Niu Y and Huang F, 2019. Fecundity of the parental and fitness of the F1 populations of corn earworm from refuge ears of seed blend plantings with Genuity SmartStaxTM maize. Crop Protection 124, 104873.

Guo W, Kain W and Wang P, 2019. Effects of disruption of the peritrophic membrane on larval susceptibility to Bt toxin Cry1Ac in cabbage loopers. Journal of insect physiology 117, 103897.

Guo Z, Gong L, Kang S, Zhou J, Sun D, Qin J, Guo L, Zhu L, Bai Y, Bravo A, Soberon M and Zhang Y, 2020. Comprehensive analysis of Cry1Ac protoxin activation mediated by midgut proteases in susceptible and resistant Plutella xylostella (L.). Pesticide Biochemistry and Physiology 163, 23-30.

Hagenbucher S, Eisenring M, Meissle M, Rathore KS and Romeis J, 2019. Constitutive and

induced insect resistance in RNAi-mediated ultra-low gossypol cottonseed cotton. Bmc Plant Biology 19, (18 July 2019).

Jagmit S, Dharminder S and Sukhdev S, 2019. Farmers' perception and evaluation of Bt cotton cultivation in Punjab. Agricultural Research Journal 56, 556-563.

Jalapathi SK, Jayaraj J, Shanthi M, Theradimani M, Balasubramani V, Irulandi S and Prabhu S, 2020. Potential of Cry1Ac from Bacillus thuringiensis against the tomato pinworm, Tuta absoluta (Meyrick) (Gelechiidae: Lepidoptera). Egyptian Journal of Biological Pest Control 30, (26 June 2020).

Jerga A, Evdokimov AG, Moshiri F, Haas JA, Chen M, Clinton W, Fu X, Halls C, Jimenez-Juarez N, Kretzler CN, Panosian TD, Pleau M, Roberts JK, Rydel TJ, Salvador S, Sequeira R, Wang Y, Zheng M and Baum JA, 2019. Disabled insecticidal proteins: a novel tool to understand differences in insect receptor utilization. Insect Biochemistry and Molecular Biology 105, 79-88.

Jin M, Liao C, Swapan C, Wu K and Xiao Y, 2019. Comparative proteomics of peritrophic matrix provides an insight into its role in Cry1Ac resistance of cotton bollworm Helicoverpa armigera. Toxins 11, 92.

Karuna R, Tanuja K, Gul MZ, Bhuvana S and Beedu SR, 2019. Immuno-analytical method development for detection of transgenic Cry1Ac protein and its validation. Journal of the Science of Food and Agriculture 99, 6903-6910.

Kuwardadra SI, Bhatt KC, Aparna P, Payal S, Pavan Kumar M, Kushaldeep Kaur S and Gurinderjit R, 2020. Monitoring adventitious presence of transgenes in brinjal (Solanum melongena L.) collections from the regions in India bordering Bangladesh: a case report. Genetic Resources and Crop Evolution 67, 1181-1192.

Levine SL, Fridley JM and Uffman JP, 2019. Assessing the potential for interaction in insecticidal activity between MON 87751 * MON 87701 produced by conventional breeding. Environmental Entomology 48, 1241-1248.

Li R, Yang S, Qiu X, Lu X, Hu Q, Ren X, Wu B, Qi L, Ding X, Xia L and Sun Y, 2019. The conserved cysteine residues in Bacillus thuringiensis Cry1Ac protoxin are not essential for the bipyramidal crystal formation. Journal of Invertebrate Pathology 163, 82-85.

Li S, Hussain F, Unnithan GC, Dong S, Zain ul A, Gu S, Mathew LG, Fabrick JA, Ni X, Carriere Y, Tabashnik BE and Li X, 2019. A long non-coding RNA regulates cadherin transcription and susceptibility to Bt toxin Cry1Ac in pink bollworm, Pectinophora gossypiella. Pesticide Biochemistry and Physiology 158, 54-60.

Li X, Ouyang X, Zhang Z, He L, Wang Y, Li Y, Zhao J, Chen Z, Wang C, Ding L, Pei Y and Xiao Y, 2019. Over-expression of the red plant gene R1 enhances anthocyanin production and resistance to bollworm and spider mite in cotton. Molecular Genetics and Genomics 294, 469-478.

Li X, Miyamoto K, Takasu Y, Wada S, Iizuka T, Adegawa S, Sato R and Watanabe K, 2020. ATP-binding cassette subfamily a member 2 is a functional receptor for Bacillus thuringiensis Cry2A toxins in Bombyx mori, but not for Cry1A, Cry1C, Cry1D, Cry1F, or Cry9A toxins. Toxins 12.

Little NS, Elkins BH, Mullen RM, Perera OP, Parys KA, Allen KC and Boykin DL, 2019. Differences between two populations of bollworm, Helicoverpa zea (Lepidoptera: Noctuidae), with variable measurements of laboratory susceptibilities to Bt toxins exposed to non-Bt and Bt cottons in large field cages. Plos One 14, e0212567.

Liu A, Huang X, Gong L, Guo Z, Zhang Y and Yang Z, 2019. Characterization of immune-related PGRP gene expression and phenoloxidase activity in Cry1Ac-susceptible and -resistant Plutella xylostella (L.). Pesticide Biochemistry and Physiology 160,

79-86.

Liu H, Hu X, Wang Y, Yang P, Shu C, Zhu X, Zhang J, Sun G, Zhang X and Li Q, 2019. Screening for Bacillus thuringiensis strains with high toxicity against Spodoptera frugiperda. Chinese Journal of Biological Control 35, 721-728.

Liu J, Nangong Z, Zhang J, Song P, Tang Y, Gao Y and Wang Q, 2019. Expression and characterization of two chitinases with synergistic effect and antifungal activity from Xenorhabdus nematophila. World journal of microbiology & biotechnology 35.

Liu Y, Li Y, Chen X, Song X, Shen P and Peng Y, 2019. No detrimental effect of Bt maize pollen containing Cry1Ab/2Aj or Cry1Ac on adult green lacewings Chrysoperla sinica Tjeder. Journal of Integrative Agriculture 18, 893-899.

Liu Z, Zhao D, Chang M, Zhang Y, Xu C, Lu X and Guo W, 2019. Gene cloning of Hyphantria cunea midgut aminopeptidase N and its binding characteristics with three Bacillus thuringiensis toxins. Acta Sericologica Sinica 24-31.

Liu J, Wang L, Zhou G, Gao S, Sun T, Liu J and Gao B, 2020. Midgut transcriptome analysis of Clostera anachoreta treated with lethal and sublethal Cry1Ac protoxin. Archives of Insect Biochemistry and Physiology 103.

Liu S, Wang S, Wu S, Wu Y and Yang Y, 2020. Proteolysis activation of Cry1Ac and Cry2Ab protoxins by larval midgut juice proteases from Helicoverpa armigera. Plos One 15.

Ma Y, Zhang J, Xiao Y, Yang Y, Liu C, Peng R, Yang Y, Bravo A, Soberon M and Liu K, 2019. The cadherin Cry1Ac binding-region is necessary for the cooperative effect with ABCC2 transporter enhancing insecticidal activity of Bacillus thuringiensis Cry1Ac toxin. Toxins 11.

Mahrukh Z, Ayesha L, Abdul Qayyum R, Saira A, Naila S, Samiullah TR, Aneela Y, Shahid AA, Nasir IA and Tayyab H, 2019. A combinational approach of enhanced methanol production and double Bt genes for broad spectrum insect resistance in transgenic cotton. Molecular biotechnology 61, 663-673.

Malaquias JB, Caprio MA, Godoy WAC, Omoto C, Ramalho FS and Pachu JKS, 2020. Experimental and theoretical landscape influences on Spodoptera frugiperda movement and resistance evolution in contaminated refuge areas of Bt cotton. Journal of Pest Science 93, 329-340.

Mamta B, Santanu D, Handique PJ, Sumita A and Sarmah BK, 2020. Defense response in chickpea pod wall due to simulated herbivory unfolds differential proteome profile. Protein Journal 39, 240-257.

Maniraj R, Karthik K, Shweta S, Vinutha T, Vandna R, Debasis P and Rohini S, 2019. Molecular interaction-based exploration of the broad spectrum efficacy of a Bacillus thuringiensis insecticidal chimeric protein, Cry1AcF. Toxins 11, 143.

Marques LH, Santos AC, Castro BA, Moscardini VF, Rosseto J, Silva OABN and Babcock JM, 2019. Assessing the efficacy of Bacillus thuringiensis (Bt) pyramided proteins Cry1F, Cry1A.105, Cry2Ab2, and Vip3Aa20 expressed in Bt maize against lepidopteran pests in Brazil. Journal of Economic Entomology 112, 803-811.

Montezano DG, Hunt TE, Specht A, Luz PMC and Peterson JA, 2019. Survival and development of Striacosta albicosta (Smith) (Lepidoptera: Noctuidae) immature stages on dry beans, non-Bt, Cry1F, and Vip3A maize. Insects 10.

Mortazavi SE, Arabsalmani M and Khankahdani HH, 2019. Field evaluation of yield and lepidopteran pest resistance in three transgenic cotton lines. Journal of Plant Protection (Mashhad) 33, 431-440.

Murua MG, Vera MA, Michel A, Casmuz AS, Fatoretto J and Gastaminza G, 2019.

Performance of field-collected Spodoptera frugiperda (Lepidoptera: Noctuidae) strains exposed to different transgenic and refuge maize hybrids in Argentina. Journal of Insect Science 19, 21.

Nava-Camberos U, Teran-Vargas AP, Aguilar-Medel S, Martinez-Carrillo JL, Avila Rodriguez V, Rocha-Munive MG, Castaneda-Contreras S, Niaves-Nava E, Mota-Sanchez D and Blanco CA, 2019. Agronomic and environmental impacts of Bt cotton in Mexico. Journal of Integrated Pest Management 10, 15.

Nazir MS, Malik TA, Shakeel A and Ahmad JN, 2019. Potential resistance of okra leaf Bt cotton against insect pests. Applied Ecology and Environmental Research 17, 5465-5469.

Nikhil R, Maniraj R, Shweta S, Karthik K, Vikraman M, Singh NK, Dash PK and Rohini S, 2020. Assessment of pigeonpea (Cajanus cajan L.) transgenics expressing Bt ICPs, Cry2Aa and Cry1AcF under nethouse containment implicated an effective control against herbivory by Helicoverpa armigera (Hubner). Pest Management Science 76, 1902-1911.

Niu L, Zhang S, Luo J, Zhang L, Gao X, Ma W, Cui J, Liu F and Ji J, 2020. Transgenic insect-resistant Bt cotton expressing Cry1Ac/CpTI does not affect the mirid bug Apolygus lucorum. Environmental Pollution 264.

Niz JM, Salvador R, Ferrelli ML, Cap ASd, Romanowski V and Berretta MF, 2020. Genetic variants in Argentinean isolates of Spodoptera frugiperda Multiple Nucleopolyhedrovirus. Virus genes 56, 401-405.

Pande R, Shah V and Verma P, 2019. First report on identification of volatiles from egg and larval frass of Indian strain of the American bollworm Helicoverpa armigera (Hubner). African Entomology 27, 403-409.

Pandey SP, Singh AP, Srivastava S, Krishnappa C and Sane AP, 2019. A strong early acting wound-inducible promoter, rbPCD1pro, activates cryIAc expression within minutes of wounding to impart efficient protection against insects. Plant Biotechnology Journal 17, 1458-1470.

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.

Park D, Choi I and Kim N, 2020. Detection of mPing mobilization in transgenic rice plants. Genes and Genomics 42, 47-54.

Paulo PDd, Fadini MAM, Marinho CGS and Mendes SM, 2019. Direct defense elicited by Tetranychus urticae Koch (Acari: Tetranychidae) in Bt maize plants. Bioscience Journal 35, 903-909.

Pinos D, Martinez-Solis M, Herrero S, Ferre J and Hernandez-Martinez P, 2019. The Spodoptera exigua ABCC2 acts as a Cry1A receptor independently of its nucleotide binding domain II. Toxins 11, 172.

Pinos D, Chakroun M, Millan-Leiva A, Jurat-Fuentes JL, Wright DJ, Hernandez-Martinez P and Ferre J, 2020. Reduced membrane-bound alkaline phosphatase does not affect binding of Vip3Aa in a Heliothis virescens resistant colony. Toxins 12.

Qi L, Qiu X, Yang S, Li R, Wu B, Cao X, He T, Ding X, Xia L and Sun Y, 2020. Cry1Ac protoxin and its activated toxin from Bacillus thuringiensis act differentially during the pathogenic process. Journal of Agricultural and Food Chemistry 68, 5816-5824.

Qiu L, Sun Y, Jiang Z, Yang P, Liu H, Zhou H, Wang X, Zhang W, Lin Y and Ma W, 2019. The midgut V-ATPase subunit A gene is associated with toxicity to crystal 2Aa and crystal 1Ca-expressing transgenic rice in Chilo suppressalis. Insect Molecular

Biology 28, 520-527.

Rabelo MM, Matos JML, Santos-Amaya OF, Franca JC, Goncalves J, Paula-Moraes SV, Guedes RNC and Pereira EJG, 2020. Bt-toxin susceptibility and hormesis-like response in the invasive southern armyworm (Spodoptera eridania). Crop Protection 132.

Rajput IA, Syed TS, Lodhi AM, Abro GH and Imran K, 2019. Comparative biology of pink bollworm, Pectinophora gossypiella Saund. on Bt. and non-Bt. cotton. Pakistan Journal of Scientific and Industrial Research, Series B: Biological Sciences 62, 116-121.

Reay-Jones FPF, 2019. Pest status and management of corn earworm (Lepidoptera: Noctuidae) in field corn in the United States. Journal of Integrated Pest Management 10, 19.

Rendon D, Taylor PW, Wilder SM and Whitehouse MEA, 2019. Does prey encounter and nutrient content affect prey selection in wolf spiders inhabiting Bt cotton fields? Plos One 14, e0210296.

Reyaz AL, Balakrishnan N and Udayasuriyan V, 2019. Genome sequencing of Bacillus thuringiensis isolate T414 toxic to pink bollworm (Pectinophora gossypiella Saunders) and its insecticidal genes. Microbial Pathogenesis 134, 103553.

Rodrigues-Silva N, Canuto AF, Oliveira DF, Teixeira AF, Santos-Amaya OF, Picanco MC and Pereira EJG, 2019. Negative cross-resistance between structurally different Bacillus thuringiensis toxins may favor resistance management of soybean looper in transgenic Bt cultivars. Scientific Reports 9, 199.

Roomi R, Dahiya KK and Adesh K, 2020. Performance of different cotton cultivars against bollworms under unsprayed condition. Journal of Experimental Zoology, India 23, 135-139.

Rosolem CA, Sarto MVM, Rocha KF, Martins JDL and Alves MS, 2019. Does the introgression of Bt gene affect physiological cotton response to water deficit? Planta Daninha 37.

Saleem MJ, Muhammad A, Sohail A and Sahi ST, 2019. Variation in susceptibility of Helicoverpa armigera (Lepidoptera: Noctuidae) to Cry1Ac toxin. Pakistan Journal of Agricultural Sciences 56, 415-420.

Salisu IB, Shahid AA, Amina Y, Rao AQ and Tayyab H, 2019. Effect of dietary supplementation of recombinant Cry and Cp4 epsps proteins on haematological indices of growing rabbits. Journal of animal physiology and animal nutrition 103, 305-316.

Shahid MI, Muhammad A, Mansoor U-H and Khan MA, 2019. Efficacy of Cry1Ac toxin from Bacillus thuringiensis against the beet armyworm, Spodoptera exigua (Hubner) (Lepidoptera: Noctuidae). Egyptian Journal of Biological Pest Control 29, (21 August 2019).

Shahid AA, Salisu IB, Amina Y, Rao AQ, Inayat U and Tayyab H, 2020. Assessing the fate of recombinant plant DNA in rabbit's tissues fed genetically modified cotton. Journal of animal physiology and animal nutrition 104, 343-351.

Shahid AA, Salisu IB, Amina Y, Rao AQ, Inayat U and Tayyab h, 2020. Assessing the fate of recombinant plant DNA in rabbit's tissues fed genetically modified cotton. Journal of animal physiology and animal nutrition 104, 343-351.

Shakeel A, Cheema HMN, Khan AA, Khan RSA and Ahmad JN, 2019. Resistance status of Helicoverpa armigera against Bt cotton in Pakistan. Transgenic Research 28, 199-212.

Shankhu PY, Chetna M, Abhishek M, Doddachowdappa S, Somvanshi VS and Dutta TK,

2020. Txp40, a protein from Photorhabdus akhurstii, conferred potent insecticidal activity against the larvae of Helicoverpa armigera, Spodoptera litura and S. exigua. Pest Management Science 76, 2004-2014.

Siddiqui HA, Muhammad A, Shaheen A, Naqvi RZ, Sobia A, Noroza U, Naveed A, Imran R, Muhammad S, Muhammad A, Imran A, Muhammad S, Zahid M, Aftab B and Shahid M, 2019. Development and evaluation of double gene transgenic cotton lines expressing Cry toxins for protection against chewing insect pests. Scientific Reports 9, 11774.

Silva Gd, Ramos LFC, Seckler HdS, Gomes FM, Cortines JR, Ramos I, Anobom CD, Machado EdA and Oliveira DMPd, 2019. Biochemical characterization of digestive membrane-associated alkaline phosphatase from the velvet bean caterpillar Anticarsia gemmatalis. Archives of Insect Biochemistry and Physiology 102, e21591.

Smith JL, Farhan Y and Schaafsma AW, 2019. Practical resistance of Ostrinia nubilalis (Lepidoptera: Crambidae) to Cry1F Bacillus thuringiensis maize discovered in Nova Scotia, Canada. Scientific Reports 9, 18247.

Song X, Chang L, Reddy GVP, Zhang L, Fan C and Wang B, 2019. Use of taxonomic and trait-based approaches to evaluate the effects of transgenic Cry1Ac corn on the community characteristics of soil Collembola. Environmental Entomology 48, 263-269.

Song Y, Liu R, Wang M, Liu M, Liu X, Ge F and Chen F, 2020. Effects of transgenic Bt rice lines with single Cry1Ab and fused Cry1Ab/Cry1Ac on the abundance dynamics and community diversity of soil mites. Archives of Agronomy and Soil Science 66, 586-599.

Sousa MFd, Fernandes MG and Guimaraes AJdS, 2019. Influence of Bt maize on diversity and composition of non-target arthropod species. Journal of Agricultural Science (Toronto) 11, 201-209.

Souza CSF, Silveira LCP, Pitta RM, Waquil JM, Pereira EJG and Mendes SM, 2019. Response of field populations and Cry-resistant strains of fall armyworm to Bt maize hybrids and Bt-based bioinsecticides. Crop Protection 120, 1-6.

Sumalatha K, Ashwini T, Reddy MK, Uma A and Mallikarjuna G, 2020. Development of transgenic cotton (Narasimha) using triple gene Cry2Ab-Cry1F-Cry1Ac construct conferring resistance to lepidopteran pest. Journal of Biosciences 45, (30 January 2020).

Tang Q, Yang Z, Han R, Zhang Y, Shen C and Wang J, 2019. No effect of Bt-transgenic rice on the tritrophic interaction of the stored rice, the maize weevil Sitophilus zeamais and the parasitoid wasp Theocolax elegans. Scientific Reports 9, 4306.

Tariku Tesfaye E, 2019. Review on bio-intensive management of African bollworm, Helicoverpa armigera (Hub.): botanicals and semiochemicals perspectives. African Journal of Agricultural Research 14, 1-9.

Torres Cabra E and Hernandez Fernandez JA, 2019. Larvicidal activity of Bacillus thuringiensis Colombian native strains against Bemisia tabaci (Hemiptera: Aleyrodidae). Journal of Plant Protection Research 59, 503-511.

Tuyet Thi Anh L, Cribb BW, Downes SJ, Perkins LE and Zalucki MP, 2019. Stay or move: how Bt-susceptible Helicoverpa armigera neonates behave on Bt cotton plants. Entomologia Experimentalis Et Applicata 167, 868-879.

Ullah MI, Muhammad A, Khan MI, Muhammad A, Khan AA, Zahid SMA, Muhammad S, Asad A, Saba K and Maryam R, 2019. Plant water stress affects the feeding performance of American bollworm, Helicoverpa armigera (Lepidoptera:

Noctuidae) on cotton plants. Pakistan Journal of Agricultural Research 32, 625-628.

Ullah MI, Muhammad A, Khan MI, Muhammad A, Khan AA, Zahid SMA, Muhammad S, Asad A, Saba K and Maryam R, 2019. Plant water stress affects the feeding performance of American bollworm, Helicoverpa armigera (Lepidoptera: Noctuidae) on cotton plants. Pakistan Journal of Agricultural Research 32, 629-635.

Vassallo CN, Figueroa Bunge F, Signorini AM, Valverde-Garcia P, Rule D and Babcock J, 2019. Monitoring the evolution of resistance in Spodoptera frugiperda (Lepidoptera: Noctuidae) to the Cry1F protein in Argentina. Journal of Economic Entomology 112, 1838-1844.

Vinha FB, Silva BFBd, Masson MB and Pinto AdS, 2019. Comparison of Bt transgenic maize in control of Elasmopalpus lignosellus in the field. Scientia Agraria Paranaensis 18, 369-376.

Wang B, Fan C, Yin J, Wu F, Wang D and Song X, 2019. Effects of planting transgenic insect-resistant maize with cry1Ac gene Bt-799 on the composition structure of soil fauna. Journal of Plant Protection 46, 167-174.

Wang B, Wang Y, Wei J, Liu C, Chen L, Khaing M and Liang G, 2019. Polycalin is involved in the action mechanism of Cry2Aa toxin in Helicoverpa armigera (Hubner). Journal of Integrative Agriculture 18, 627-635.

Wang J, Zhang J, Guo Y, Chen L, Wang F, Huang M, Gao S and Wang R, 2019. Molecular cloning, characterization, and expression profiling analysis of Cry toxin receptor genes from sugarcane shoot borer Chilo infuscatellus (Snellen). Pesticide Biochemistry and Physiology 157, 186-195.

Wang L, Ma Y, Guo X, Wan P, Liu K, Cong S, Wang J, Xu D, Xiao Y, Li X, Tabashnik BE and Wu K, 2019. Pink bollworm resistance to Bt toxin Cry1Ac associated with an insertion in cadherin exon 20. Toxins 11, 186.

Wang L, Wang J, Ma Y, Wan P, Liu K, Cong S, Xiao Y, Xu D, Wu K, Fabrick JA, Li X and Tabashnik BE, 2019. Transposon insertion causes cadherin mis-splicing and confers resistance to Bt cotton in pink bollworm from China. Scientific Reports 9, 7479.

Wang P, Ma J, Head GP, Xia D, Li J, Wang H, Yang M, Xie Z, Zalucki MP and Lu Z, 2019. Susceptibility of Helicoverpa armigera to two Bt toxins, Cry1Ac and Cry2Ab, in northwestern China: toward developing an IRM strategy. Journal of Pest Science 92, 923-931.

Wang B, Wei J, Wang Y, Chen L and Liang G, 2020. Polycalin is involved in the toxicity and resistance to Cry1Ac toxin in Helicoverpa armigera (Hubner). Archives of Insect Biochemistry and Physiology 104.

Wang J, Xu D, Wang L, Cong S, Wan P, Lei C, Fabrick JA, Li X, Tabashnik BE and Wu K, 2020. Bt resistance alleles in field populations of pink bollworm from China: similarities with the United States and decreased frequency from 2012 to 2015. Pest Management Science 76, 527-533.

Wei J, Zhang M, Liang G and Li X, 2019. Alkaline phosphatase 2 is a functional receptor of Cry1Ac but not Cry2Ab in Helicoverpa zea. Insect Molecular Biology 28, 372-379.

Wu AJ, Chapman K, Sathischandra S, Massengill J, Araujo R, Soria M, Bugas M, Bishop Z, Haas C, Holliday B, Cisneros K, Lor J, Canez C, New S, Mackie S, Ghoshal D, Privalle L, Hunst P and Pallett K, 2019. GHB614 * T304-40 * GHB119 * COT102 cotton: protein expression analyses of field-grown samples. Journal of Agricultural and Food Chemistry 67, 275-281.

Xie X, Cui Z, Wang Y, Wang Y, Cao F, Romeis J, Peng Y and Li Y, 2019. Bacillus

thuringiensis maize expressing a fusion gene Cry1Ab/Cry1AcZM does not harm valued pollen feeders. Toxins 11, 8.

Yan X, Lu J, Ren M, He Y, Wang Y, Wang Z and He K, 2020. Insecticidal activity of 11 Bt toxins and 3 transgenic maize events expressing Vip3Aa19 to black cutworm, Agrotis ipsilon (Hufnagel). Insects 11.

Yang F, Gonzalez JCS, Williams J, Cook DC, Gilreath RT and Kerns DL, 2019. Occurrence and ear damage of Helicoverpa zea on transgenic Bacillus thuringiensis maize in the field in Texas, U.S. and its susceptibility to Vip3A protein. Toxins 11, 102.

Yang Y, Xu H, Wu Z and Lu Z, 2020. pH influences the profiles of midgut extracts in Cnaphalocrocis medinalis (Guenee) and its degradation of activated Cry toxins. Journal of Integrative Agriculture 19, 775-784.

Zhang C, Wang J, Zhao J, Pang D, Zhang D and Yang M, 2019. Expression characteristics of Bt gene in transgenic poplar transformed by different multi-gene vectors. Scientia Silvae Sinicae 55, 61-70.

Zhang D, Xiao Y, Chen W, Lu Y and Wu K, 2019. Field monitoring of Helicoverpa armigera (Lepidoptera: Noctuidae) Cry1Ac insecticidal protein resistance in China (2005-2017). Pest Management Science 75, 753-759.

Zhang M, Feng M, Xiao L, Song X, Ding G and Yang W, 2019. Persistence of Cry1Ac protein from transgenic Bt cotton cultivation and residue returning in fields and its effect on functional diversity of soil microbial communities. Pedosphere 29, 114-122.

Zhang M, Wei J, Ni X, Zhang J, Jurat-Fuentes JL, Fabrick JA, Carriere Y, Tabashnik BE and Li X, 2019. Decreased Cry1Ac activation by midgut proteases associated with Cry1Ac resistance in Helicoverpa zea. Pest Management Science 75, 1099-1106.

Zhang J, Jin M, Yang Y, Liu L, Yang Y, Gomez I, Bravo A, Soberon M, Xiao Y and Liu K, 2020. The cadherin protein is not involved in susceptibility to Bacillus thuringiensis Cry1AB or Cry1Fa toxins in Spodoptera frugiperda. Toxins 12.

Zhao X, 2020. Progress in understanding hormonal regulation during the postembryonic development of Helicoverpa armigera. Journal of Integrative Agriculture 19, 1417-1428.

Zhou L, Alphey N, Walker AS, Travers LM, Morrison NI, Bonsall MB and Raymond B, 2019. The application of self-limiting transgenic insects in managing resistance in experimental metapopulations. Journal of Applied Ecology 56, 688-698.

Zhou J, Guo Z, Kang S, Qin J, Gong L, Sun D, Guo L, Zhu L, Bai Y, Zhang Z, Zhou X and Zhang Y, 2020. Reduced expression of the P-glycoprotein gene PxABCB1 is linked to resistance to Bacillus thuringiensis Cry1Ac toxin in Plutella xylostella (L.). Pest Management Science 76, 712-720.

Zhu C, Niu Y, Zhou Y, Guo J, Head GP, Price PA, Wen X and Huang F, 2019. Survival and effective dominance level of a Cry1A.105/Cry2Ab2-dual gene resistant population of Spodoptera frugiperda (J.E. Smith) on common pyramided Bt corn traits. Crop Protection 115, 84-91.

3. <u>Entries retrieved using MEDLINE</u>

Abdelgaffar H, Tague ED, Castro Gonzalez HF, Campagna SR and Jurat-Fuentes JL, 2019. Midgut metabolomic profiling of fall armyworm (Spodoptera frugiperda) with field-evolved resistance to Cry1F corn. Insect Biochemistry and Molecular Biology 106, 1-9.

Abdelgaffar HM, Oppert C, Sun X, Monserrate J and Jurat-Fuentes JL, 2019. Differential heliothine susceptibility to Cry1Ac associated with gut proteolytic activity. Pesticide Biochemistry and Physiology 153, 1-8.

Abdelgaffar H, Perera OP and Jurat-Fuentes JL, 2020. ABC transporter mutations in Cry1F-resistant fall armyworm (Spodoptera frugiperda) do not result in altered susceptibility to selected small molecule pesticides. Pest Management Science.

Ahmad S, Cheema HMN, Khan AA, Khan RSA and Ahmad JN, 2019. Resistance status of Helicoverpa armigera against Bt cotton in Pakistan. Transgenic Research 28, 199-212.

Ali Q, Salisu IB, Shahid AA, Liaqat A and Rao AQ, 2020. A 90-day subchronic toxicity study of transgenic cotton expressing Cry1Ac, Cry2A and CP4-EPSPS proteins in Sprague-Dawley rats. Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association 111783.

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 & food 11, 206-214.

Bally J, Fishilevich E, Doran RL, Lee K, de Campos SB, German MA, Narva KE and Waterhouse PM, 2020. Plin-amiR, a pre-microRNA-based technology for controlling herbivorous insect pests. Plant Biotechnology Journal 18, 1925-1932.

Bel Y, Zack M, Narva K and Escriche B, 2019. Specific binding of Bacillus thuringiensis Cry1Ea toxin, and Cry1Ac and Cry1Fa competition analyses in Anticarsia gemmatalis and Chrysodeixis includens. Scientific Reports 9, 18201.

Bilbo TR, Reay-Jones FPF, Reisig DD and Greene JK, 2019. Susceptibility of Corn Earworm (Lepidoptera: Noctuidae) to Cry1A.105 and Cry2Ab2 in North and South Carolina. Journal of Economic Entomology 112, 1845-1857.

Bilbo TR, Reay-Jones FPF, Reisig DD, Greene JK and Turnbull MW, 2019. Development, survival, and feeding behavior of Helicoverpa zea (Lepidoptera: Noctuidae) relative to Bt protein concentrations in corn ear tissues. Plos One 14, e0221343.

Boaventura D, Ulrich J, Lueke B, Bolzan A, Okuma D, Gutbrod O, Geibel S, Zeng Q, Dourado PM, Martinelli S, Flagel L, Head G and Nauen R, 2020. Molecular characterization of Cry1F resistance in fall armyworm, Spodoptera frugiperda from Brazil. Insect Biochemistry and Molecular Biology 116, 103280.

Boonchaisri S, Rochfort S, Stevenson T and Dias DA, 2019. Recent developments in metabolomics-based research in understanding transgenic grass metabolism. Metabolomics : Official journal of the Metabolomic Society 15, 47.

Botha AS, Erasmus A, du Plessis H and Van den Berg J, 2019. Efficacy of Bt Maize for Control of Spodoptera frugiperda (Lepidoptera: Noctuidae) in South Africa. Journal of Economic Entomology 112, 1260-1266.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Helicoverpa zea (Lepidoptera: Noctuidae) Preference for Plant Structures, and Their Location, Within Bt Cotton Under Different Nitrogen and Irrigation Regimes. Journal of Economic Entomology 112, 1741-1751.

Braswell LR, Reisig DD, Sorenson CE and Collins GD, 2019. Helicoverpa zea (Lepidoptera: Noctuidae) Oviposition and Larval Vertical Distribution in Bt Cotton Under Different Levels of Nitrogen and Irrigation. Journal of Economic Entomology 112, 1237-1250.

Caprio MA, Kurtz R, Catchot A, Kerns D, Reisig D, Gore J and Reay-Jones FPF, 2019. The Corn-Cotton Agroecosystem in the Mid-Southern United States: What Insecticidal Event Pyramids Should be Used in Each Crop to Extend Vip3A Durability. Journal of Economic Entomology 112, 2894-2906.

Carlson AB, Mukerji P, Mathesius CA, Huang E, Herman RA, Hoban D, Thurman JD and

Roper JM, 2020. DP-2O2216-6 maize does not adversely affect rats in a 90-day feeding study. Regulatory toxicology and pharmacology : RTP 117, 104779.

Carriere Y, Degain B, Unnithan GC, Harpold VS, Li X and Tabashnik BE, 2019. Seasonal Declines in Cry1Ac and Cry2Ab Concentration in Maturing Cotton Favor Faster Evolution of Resistance to Pyramided Bt Cotton in Helicoverpa zea (Lepidoptera: Noctuidae). Journal of Economic Entomology 112, 2907-2914.

Carriere Y, Degain BA, Harpold VS, Unnithan GC and Tabashnik BE, 2020. Gene Flow Between Bt and Non-Bt Plants in a Seed Mixture Increases Dominance of Resistance to Pyramided Bt Corn in Helicoverpa zea (Lepidoptera: Noctuidae). Journal of Economic Entomology.

Chen Y, Li Y, Zhou M, Cai Z, Tambel LIM, Zhang X, Chen Y and Chen D, 2019. Nitrogen deficit decreases seed Cry1Ac endotoxin expression in Bt transgenic cotton. Plant physiology and biochemistry : PPB 141, 114-121.

Coates BS, Abel CA, Swoboda-Bhattarai KA, Palmquist DE, Montezano DG, Zukoff SN, Wang Y, Bradshaw JD, DiFonzo CD, Shields E, Tilmon KJ, Hunt TE and Peterson JA, 2020. Geographic Distribution of Bacillus thuringiensis Cry1F Toxin Resistance in Western Bean Cutworm (Lepidoptera: Noctuidae) Populations in the United States. Journal of Economic Entomology.

da Silva G, Costa Ramos LF, Dos Santos Seckler H, Mendonca Gomes F, Reis Cortines J, Ramos I, Dinis Anobom C, de Alcantara Machado E and Perpetua de Oliveira DM, 2019. Biochemical characterization of digestive membrane-associated alkaline phosphatase from the velvet bean caterpillar Anticarsia gemmatalis. Archives of Insect Biochemistry and Physiology 102, e21591.

Dandan Z, Yutao X, Wenbo C, Yanhui L and Kongming W, 2019. Field monitoring of Helicoverpa armigera (Lepidoptera: Noctuidae) Cry1Ac insecticidal protein resistance in China (2005-2017). Pest Management Science 75, 753-759.

Deng J, Wang Y, Yang F, Liu Y and Liu B, 2019. Persistence of insecticidal Cry toxins in Bt rice residues under field conditions estimated by biological and immunological assays. The Science of the total environment 679, 45-51.

Dessoky ES, Ismail RM, Elarabi NI, Abdelhadi AA and Abdallah NA, 2021. Improvement of sugarcane for borer resistance using Agrobacterium mediated transformation of cry1Ac gene. GM crops & food 12, 47-56.

Dhanaraj AL, Willse AR and Kamath SP, 2019. Stability of expression of Cry1Ac and Cry2Ab2 proteins in Bollgard-II hybrids at different stages of crop growth in different genotypes across cropping seasons and multiple geographies. Transgenic Research 28, 33-50.

Ding R, Ma D, Uwais A, Wang D, Liu J, Xu Y, Li H, Li H and Pan H, 2019. Transgenic Cry1Ac cotton does not affect the development and fecundity of Chrysoperla carnea. Plos One 14, e0214668.

Dominguez-Mendez R, Alcantara-de la Cruz R, Rojano-Delgado AM, da Silveira HM, Portugal J, Cruz-Hipolito HE and De Prado R, 2019. Stacked traits conferring multiple resistance to imazamox and glufosinate in soft wheat. Pest Management Science 75, 648-657.

Dong S, Liu Y, Zhang X, Xu C, Liu X and Zhang C, 2019. Development of an immunochromatographic assay for the specific detection of Bacillus thuringiensis (Bt) Cry1Ab toxin. Analytical biochemistry 567, 1-7.

Duan H, Yang X, Bu Z, Li X, Zhang Z and Sun W, 2020. Identification and Characterization of Genes Involved in Ecdysteroid Esterification Pathway Contributing to the High 20-Hydroxyecdysone Resistance of Helicoverpa armigera. Frontiers in Physiology

11, 508.
Eisenring M, Naranjo SE, Bacher S, Abbott A, Meissle M and Romeis J, 2019. Reduced caterpillar damage can benefit plant bugs in Bt cotton. Scientific Reports 9, 2727.
Fabrick JA, LeRoy DM, Unnithan GC, Yelich AJ, Carriere Y, Li X and Tabashnik BE, 2020. Shared and Independent Genetic Basis of Resistance to Bt Toxin Cry2Ab in Two Strains of Pink Bollworm. Scientific Reports 10, 7988.
Fabrick JA, Mathew LG, LeRoy DM, Hull JJ, Unnithan GC, Yelich AJ, Carriere Y, Li X and Tabashnik BE, 2020. Reduced cadherin expression associated with resistance to Bt toxin Cry1Ac in pink bollworm. Pest Management Science 76, 67-74.
Fanela TLM, Baldin ELL, Hunt TE and Faria RD, 2020. Baseline Plant-to-Plant Larval Movement of Spodoptera eridania in Bt and Non-Bt Soybean and Its Possible Impacts on IRM. Journal of Economic Entomology 113, 1741-1752.
Fernandes MG, Costa EN, Dutra CC and Raizer J, 2019. Species Richness and Community Composition of Ants and Beetles in Bt and non-Bt Maize Fields. Environmental Entomology 48, 1095-1103.
Fritz ML, Nunziata SO, Guo R, Tabashnik BE and Carriere Y, 2020. Mutations in a Novel Cadherin Gene Associated with Bt Resistance in Helicoverpa zea. G3 (Bethesda, Md) 10, 1563-1574.
G Montezano D, Hunt TE, Specht A, C Luz PM and Peterson JA, 2019. Survival and Development of Striacosta albicosta (Smith) (Lepidoptera: Noctuidae) Immature Stages on Dry Beans, non-Bt, Cry1F, and Vip3A Maize. Insects 10.
Gao M, Dong S, Hu X, Zhang X, Liu Y, Zhong J, Lu L, Wang Y, Chen L and Liu X, 2019. Roles of Midgut Cadherin from Two Moths in Different Bacillus thuringiensis Action Mechanisms: Correlation among Toxin Binding, Cellular Toxicity, and Synergism. Journal of Agricultural and Food Chemistry 67, 13237-13246.
Gao J, Qian H, Guo X, Mi Y, Guo J, Zhao J, Xu C, Zheng T, Duan M, Tang Z, Lin C, Shen Z, Jiang Y and Wang X, 2020. The signal peptide of Cry1Ia can improve the expression of eGFP or mCherry in Escherichia coli and Bacillus thuringiensis and enhance the host's fluorescent intensity. Microbial Cell Factories 19, 112.
Garcia-Gomez BI, Cano SN, Zagal EE, Dantan-Gonzalez E, Bravo A and Soberon M, 2019. Insect Hsp90 Chaperone Assists Bacillus thuringiensis Cry Toxicity by Enhancing Protoxin Binding to the Receptor and by Protecting Protoxin from Gut Protease Degradation. mBio 10.
Gartia J, Barnwal RP, Anangi R, Giri AR, King G and Chary KVR, 2019. 1H, 13C and 15N NMR assignments of two plant protease inhibitors (IRD7 and IRD12) from the plant Capsicum annuum. Biomolecular NMR assignments 13, 31-35.
Gomez I, Ocelotl J, Sanchez J, Aguilar-Medel S, Pena-Chora G, Lina-Garcia L, Bravo A and Soberon M, 2020. Bacillus thuringiensis Cry1Ab domain III beta-22 mutants with enhanced toxicity to Spodoptera frugiperda (J. E. Smith). Applied and Environmental Microbiology.
Gong L, Kang S, Zhou J, Sun D, Guo L, Qin J, Zhu L, Bai Y, Ye F, Akami M, Wu Q, Wang S, Xu B, Yang Z, Bravo A, Soberon M, Guo Z, Wen L and Zhang Y, 2020. Reduced Expression of a Novel Midgut Trypsin Gene Involved in Protoxin Activation Correlates with Cry1Ac Resistance in a Laboratory-Selected Strain of Plutella xylostella (L.). Toxins 12.
Guan R, Chen Q, Li H, Hu S, Miao X, Wang G and Yang B, 2019. Knockout of the HaREase Gene Improves the Stability of dsRNA and Increases the Sensitivity of Helicoverpa armigera to Bacillus thuringiensis Toxin. Frontiers in Physiology 10, 1368.

Guan F, Zhang J, Shen H, Wang X, Padovan A, Walsh TK, Tay WT, Gordon KHJ, James W, Czepak C, Otim MH, Kachigamba D and Wu Y, 2020. Whole-genome sequencing to detect mutations associated with resistance to insecticides and Bt proteins in Spodoptera frugiperda. Insect Science.

Guo W, Kain W and Wang P, 2019. Effects of disruption of the peritrophic membrane on larval susceptibility to Bt toxin Cry1Ac in cabbage loopers. Journal of insect physiology 117, 103897.

Guo Z, Sun D, Kang S, Zhou J, Gong L, Qin J, Guo L, Zhu L, Bai Y, Luo L and Zhang Y, 2019. CRISPR/Cas9-mediated knockout of both the PxABCC2 and PxABCC3 genes confers high-level resistance to Bacillus thuringiensis Cry1Ac toxin in the diamondback moth, Plutella xylostella (L.). Insect Biochemistry and Molecular Biology 107, 31-38.

Guo Z, Gong L, Kang S, Zhou J, Sun D, Qin J, Guo L, Zhu L, Bai Y, Bravo A, Soberon M and Zhang Y, 2020. Comprehensive analysis of Cry1Ac protoxin activation mediated by midgut proteases in susceptible and resistant Plutella xylostella (L.). Pesticide Biochemistry and Physiology 163, 23-30.

Gupta R, Baruah AM, Acharjee S and Sarmah BK, 2020. Compositional analysis of transgenic Bt-chickpea resistant to Helicoverpa armigera. GM crops & food 11, 262-274.

Hao J, Gao M, Hu X, Lu L, Zhang X, Liu Y, Zhong J and Liu X, 2020. Synergistic selection of a Helicoverpa armigera cadherin fragment with Cry1Ac in different cells and insects. International Journal of Biological Macromolecules.

Huang C-W, Chen W-J, Ke X, Li Y and Luan Y-X, 2019. A multi-generational risk assessment of Cry1F on the non-target soil organism Folsomia candida (Collembola) based on whole transcriptome profiling. Peerj 7, e6924.

Huang F, 2020. Resistance of the fall armyworm, Spodoptera frugiperda, to transgenic Bacillus thuringiensis Cry1F corn in the Americas: lessons and implications for Bt corn IRM in China. Insect Science.

Huang J, Xu Y, Zuo Y, Yang Y, Tabashnik BE and Wu Y, 2020. Evaluation of five candidate receptors for three Bt toxins in the beet armyworm using CRISPR-mediated gene knockouts. Insect Biochemistry and Molecular Biology 121, 103361.

Huseth AS, D'Ambrosio DA and Kennedy GG, 2020. Understanding the potential impact of continued seed treatment use for resistance management in Cry51Aa2.834_16 Bt cotton against Frankliniella fusca. Plos One 15, e0239910.

Jaleel W, Saeed S, Naqqash MN, Sial MU, Ali M, Zaka SM, Sarwar ZM, Ishtiaq M, Qayyum MA, Aine QU, Anwar A, Sarmad M, Azad R, Latif M, Ahmed F, Islam W, Khan KA and Ghramh HA, 2020. Effects of temperature on baseline susceptibility and stability of insecticide resistance against Plutella xylostella (Lepidoptera: Plutellidae) in the absence of selection pressure. Saudi journal of biological sciences 27, 1-5.

Jamil S, Shahzad R, Rahman SU, Iqbal MZ, Yaseen M, Ahmad S and Fatima R, 2021. The level of Cry1Ac endotoxin and its efficacy against H. armigera in Bt cotton at large scale in Pakistan. GM crops & food 12, 1-17.

Jerga A, Evdokimov AG, Moshiri F, Haas JA, Chen M, Clinton W, Fu X, Halls C, Jimenez-Juarez N, Kretzler CN, Panosian TD, Pleau M, Roberts JK, Rydel TJ, Salvador S, Sequeira R, Wang Y, Zheng M and Baum JA, 2019. Disabled insecticidal proteins: A novel tool to understand differences in insect receptor utilization. Insect Biochemistry and Molecular Biology 105, 79-88.

Jimenez-Chavez AdJ, Moreno-Fierros L and Bustos-Jaimes I, 2019. Therapy with multi-

epitope virus-like particles of B19 parvovirus reduce tumor growth and lung metastasis in an aggressive breast cancer mouse model. Vaccine 37, 7256-7268.

Jin M, Liao C, Chakrabarty S, Wu K and Xiao Y, 2019. Comparative Proteomics of Peritrophic Matrix Provides an Insight into its Role in Cry1Ac Resistance of Cotton Bollworm Helicoverpa armigera. Toxins 11.

Jin M-H, Xiao Y-T, Cheng Y, Hu J, Xue C-B and Wu K-M, 2019. Chromosomal deletions mediated by CRISPR/Cas9 in Helicoverpa armigera. Insect Science 26, 1029-1036.

Karar H, Bashir MA, Haider M, Haider N, Khan KA, Ghramh HA, Ansari MJ, Mutlu C and Alghanem SM, 2020. Pest susceptibility, yield and fiber traits of transgenic cotton cultivars in Multan, Pakistan. Plos One 15, e0236340.

Katta S, Talakayala A, Reddy MK, Addepally U and Garladinne M, 2020. Development of transgenic cotton (Narasimha) using triple gene Cry2Ab-Cry1F-Cry1Ac construct conferring resistance to lepidopteran pest. Journal of Biosciences 45.

Kaur G, Guo J, Brown S, Head GP, Price PA, Paula-Moraes S, Ni X, Dimase M and Huang F, 2019. Field-evolved resistance of Helicoverpa zea (Boddie) to transgenic maize expressing pyramided Cry1A.105/Cry2Ab2 proteins in northeast Louisiana, the United States. Journal of Invertebrate Pathology 163, 11-20.

Krogh PH, Kostov K and Damgaard CF, 2020. The effect of Bt crops on soil invertebrates: a systematic review and quantitative meta-analysis. Transgenic Research.

Lawrie RD, Mitchell Iii RD, Deguenon JM, Ponnusamy L, Reisig D, Pozo-Valdivia AD, Kurtz RW and Roe RM, 2020. Multiple Known Mechanisms and a Possible Role of an Enhanced Immune System in Bt-Resistance in a Field Population of the Bollworm, Helicoverpa zea: Differences in Gene Expression with RNAseq. International Journal of Molecular Sciences 21.

Levine SL, Fridley JM and Uffman JP, 2019. Assessing the Potential for Interaction in Insecticidal Activity Between MON 87751 * MON 87701 Produced by Conventional Breeding. Environmental Entomology 48, 1241-1248.

Li R, Yang S, Qiu X, Lu X, Hu Q, Ren X, Wu B, Qi L, Ding X, Xia L and Sun Y, 2019. The conserved cysteine residues in Bacillus thuringiensis Cry1Ac protoxin are not essential for the bipyramidal crystal formation. Journal of Invertebrate Pathology 163, 82-85.

Li S, Hussain F, Unnithan GC, Dong S, UlAbdin Z, Gu S, Mathew LG, Fabrick JA, Ni X, Carriere Y, Tabashnik BE and Li X, 2019. A long non-coding RNA regulates cadherin transcription and susceptibility to Bt toxin Cry1Ac in pink bollworm, Pectinophora gossypiella. Pesticide Biochemistry and Physiology 158, 54-60.

Li X, Ouyang X, Zhang Z, He L, Wang Y, Li Y, Zhao J, Chen Z, Wang C, Ding L, Pei Y and Xiao Y, 2019. Over-expression of the red plant gene R1 enhances anthocyanin production and resistance to bollworm and spider mite in cotton. Molecular genetics and genomics : MGG 294, 469-478.

Li G, Huang J, Ji T, Tian C, Zhao X and Feng H, 2020. Baseline susceptibility and resistance allele frequency in Ostrinia furnacalis related to Cry1 toxins in the Huanghuaihai summer corn region of China. Pest Management Science.

Li X, Miyamoto K, Takasu Y, Wada S, Iizuka T, Adegawa S, Sato R and Watanabe K, 2020. ATP-Binding Cassette Subfamily A Member 2 is a Functional Receptor for Bacillus thuringiensis Cry2A Toxins in Bombyx mori, but not for Cry1A, Cry1C, Cry1D, Cry1F, or Cry9A Toxins. Toxins 12.

Li Y, Hallerman EM, Wu K and Peng Y, 2020. Insect-Resistant Genetically Engineered Crops in China: Development, Application, and Prospects for Use. Annual review of entomology 65, 273-292.

Little NS, Elkins BH, Mullen RM, Perera OP, Parys KA, Allen KC and Boykin DL, 2019. Differences between two populations of bollworm, Helicoverpa zea (Lepidoptera: Noctuidae), with variable measurements of laboratory susceptibilities to Bt toxins exposed to non-Bt and Bt cottons in large field cages. Plos One 14, e0212567.

Liu A, Huang X, Gong L, Guo Z, Zhang Y and Yang Z, 2019. Characterization of immune-related PGRP gene expression and phenoloxidase activity in Cry1Ac-susceptible and -resistant Plutella xylostella (L.). Pesticide Biochemistry and Physiology 160, 79-86.

Liu J, NanGong Z, Zhang J, Song P, Tang Y, Gao Y and Wang Q, 2019. Expression and characterization of two chitinases with synergistic effect and antifungal activity from Xenorhabdus nematophila. World journal of microbiology & biotechnology 35, 106.

Liu Z, Zhu Z and Zhang T, 2019. Development of Transgenic CryIA(c) + GNA Cotton Plants via Pollen-Tube Pathway Method Confers Resistance to Helicoverpa armigera and Aphis gossypii Glover. Methods in molecular biology (Clifton, NJ) 1902, 233-244.

Liu J, Wang L, Zhou G, Gao S, Sun T, Liu J and Gao B, 2020. Midgut transcriptome analysis of Clostera anachoretatreated with lethal and sublethal Cry1Ac protoxin. Archives of Insect Biochemistry and Physiology 103, e21638.

Liu S, Wang S, Wu S, Wu Y and Yang Y, 2020. Proteolysis activation of Cry1Ac and Cry2Ab protoxins by larval midgut juice proteases from Helicoverpa armigera. Plos One 15, e0228159.

Liu W, Liu X, Liu C, Zhang Z and Jin W, 2020. Development of a sensitive monoclonal antibody-based sandwich ELISA to detect Vip3Aa in genetically modified crops. Biotechnology Letters 42, 1467-1478.

Liu Z, Fu S, Ma X, Baxter SW, Vasseur L, Xiong L, Huang Y, Yang G, You S and You M, 2020. Resistance to Bacillus thuringiensis Cry1Ac toxin requires mutations in two Plutella xylostella ATP-binding cassette transporter paralogs. PLoS Pathogens 16, e1008697.

Lv J, Zhang X, Gao T, Cui T, Peng Q, Zhang J and Song F, 2019. Effect of the spoIIID mutation on mother cell lysis in Bacillus thuringiensis. Applied Microbiology and Biotechnology 103, 4103-4112.

Ma W and Zhang T, 2019. Next-Generation Transgenic Cotton: Pyramiding RNAi with Bt Counters Insect Resistance. Methods in molecular biology (Clifton, NJ) 1902, 245-256.

Ma Y, Zhang J, Xiao Y, Yang Y, Liu C, Peng R, Yang Y, Bravo A, Soberon M and Liu K, 2019. The Cadherin Cry1Ac Binding-Region is Necessary for the Cooperative Effect with ABCC2 Transporter Enhancing Insecticidal Activity of Bacillus thuringiensis Cry1Ac Toxin. Toxins 11.

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.

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.

Marotti I, Whittaker A, Benedettelli S, Dinelli G and Bosi S, 2020. Evaluation of the

propensity of interspecific hybridization between oilseed rape (Brassica napus L.) to wild-growing black mustard (Brassica nigra L.) displaying mixoploidy. Plant science : an international journal of experimental plant biology 296, 110493.

Marques LH, Santos AC, Castro BA, Moscardini VF, Rosseto J, Silva OABN and Babcock JM, 2019. Assessing the Efficacy of Bacillus thuringiensis (Bt) Pyramided Proteins Cry1F, Cry1A.105, Cry2Ab2, and Vip3Aa20 Expressed in Bt Maize Against Lepidopteran Pests in Brazil. Journal of Economic Entomology 112, 803-811.

Mendoza-Almanza G, Rocha-Zavaleta L, Aguilar-Zacarias C, Ayala-Lujan J and Olmos J, 2019. Cry1A Proteins are Cytotoxic to HeLa but not to SiHa Cervical Cancer Cells. Current pharmaceutical biotechnology 20, 1018-1027.

Muraro DS, Stacke RF, Cossa GE, Godoy DN, Garlet CG, Valmorbida I, O'Neal ME and Bernardi O, 2020. Performance of Seed Treatments Applied on Bt and Non-Bt Maize Against Fall Armyworm (Lepidoptera: Noctuidae). Environmental Entomology.

Murua MG, Vera MA, Michel A, Casmuz AS, Fatoretto J and Gastaminza G, 2019. Performance of Field-Collected Spodoptera frugiperda (Lepidoptera: Noctuidae) Strains Exposed to Different Transgenic and Refuge Maize Hybrids in Argentina. Journal of insect science (Online) 19.

Niu L, Liu F, Zhang S, Luo J, Zhang L, Ji J, Gao X, Ma W and Cui J, 2020. Transgenic insect-resistant Bt cotton expressing Cry1Ac/CpTI does not affect the mirid bug Apolygus lucorum. Environmental pollution (Barking, Essex : 1987) 264, 114762.

Pan J, Lv X, Jin D, Bai Z, Qi H, Zhang H and Zhuang G, 2019. Developmental stage has a greater effect than Cry1Ac expression in transgenic cotton on the phyllosphere mycobiome. Canadian journal of microbiology 65, 116-125.

Pandey SP, Singh AP, Srivastava S, Chandrashekar K and Sane AP, 2019. A strong early acting wound-inducible promoter, RbPCD1pro, activates cryIAc expression within minutes of wounding to impart efficient protection against insects. Plant Biotechnology Journal 17, 1458-1470.

Park D, Choi I-Y and Kim N-S, 2020. Detection of mPing mobilization in transgenic rice plants. Genes & genomics 42, 47-54.

Pinos D, Martinez-Solis M, Herrero S, Ferre J and Hernandez-Martinez P, 2019. The Spodoptera exigua ABCC2 Acts as a Cry1A Receptor Independently of its Nucleotide Binding Domain II. Toxins 11.

Pinos D, Chakroun M, Millan-Leiva A, Jurat-Fuentes JL, Wright DJ, Hernandez-Martinez P and Ferre J, 2020. Reduced Membrane-Bound Alkaline Phosphatase Does Not Affect Binding of Vip3Aa in a Heliothis virescens Resistant Colony. Toxins 12.

Prodhan MZH, Shirale DK, Islam MZ, Hossain MJ, Paranjape V and Shelton AM, 2019. Susceptibility of Field Populations of Eggplant Fruit and Shoot Borer (Leucinodes orbonalis Guenee) to Cry1Ac, the Protein Expressed in Bt Eggplant (Solanum melongena L.) in Bangladesh. Insects 10.

Qi L, Qiu X, Yang S, Li R, Wu B, Cao X, He T, Ding X, Xia L and Sun Y, 2020. Cry1Ac Protoxin and Its Activated Toxin from Bacillus thuringiensis Act Differentially during the Pathogenic Process. Journal of Agricultural and Food Chemistry 68, 5816-5824.

Qiu L, Sun Y, Jiang Z, Yang P, Liu H, Zhou H, Wang X, Zhang W, Lin Y and Ma W, 2019. The midgut V-ATPase subunit A gene is associated with toxicity to crystal 2Aa and crystal 1Ca-expressing transgenic rice in Chilo suppressalis. Insect Molecular Biology 28, 520-527.

Qiu X, Lu X, Ren X, Li R, Wu B, Yang S, Qi L, Mo X, Ding X, Xia L and Sun Y, 2019.

Solubility enhancement of Cry2Aa crystal through carboxy-terminal extension and synergism between the chimeric protein and Cry1Ac. Applied Microbiology and Biotechnology 103, 2243-2250.

Rabelo MM, Matos JML, Orozco-Restrepo SM, Paula-Moraes SV and Pereira EJG, 2020. Like Parents, Like Offspring? Susceptibility to Bt Toxins, Development on Dual-Gene Bt Cotton, and Parental Effect of Cry1Ac on a Nontarget Lepidopteran Pest. Journal of Economic Entomology 113, 1234-1242.

Rabelo MM, Paula-Moraes SV, Pereira EJG and Siegfried BD, 2020. Demographic Performance of Helicoverpa zea Populations on Dual and Triple-Gene Bt Cotton. Toxins 12.

Reay-Jones FPF, Bilbo TR and Reisig DD, 2020. Decline in Sublethal Effects of Bt Corn on Corn Earworm (Lepidoptera: Noctuidae) Linked to Increasing Levels of Resistance. Journal of Economic Entomology.

Rendon D, Taylor PW, Wilder SM and Whitehouse MEA, 2019. Does prey encounter and nutrient content affect prey selection in wolf spiders inhabiting Bt cotton fields? Plos One 14, e0210296.

Reyaz AL, Balakrishnan N and Udayasuriyan V, 2019. Genome sequencing of Bacillus thuringiensis isolate T414 toxic to pink bollworm (Pectinophora gossypiella Saunders) and its insecticidal genes. Microbial Pathogenesis 134, 103553.

Riaz Marral MW, Khan MB, Ahmad F, Farooq S and Hussain M, 2020. The influence of transgenic (Bt) and non-transgenic (non-Bt) cotton mulches on weed dynamics, soil properties and productivity of different winter crops. Plos One 15, e0238716.

Rivero-Borja M, Rodriguez-Maciel JC, Urzua Gutierrez JA, Silva-Aguayo G, Chandrasena DI, Felix-Bermudez NC and Storer NP, 2020. Baseline of Susceptibility to the Cry1F Protein in Mexican Populations of Fall Armyworm. Journal of Economic Entomology 113, 390-398.

Rodrigues-Silva N, Canuto AF, Oliveira DF, Teixeira AF, Santos-Amaya OF, Picanco MC and Pereira EJG, 2019. Negative cross-resistance between structurally different Bacillus thuringiensis toxins may favor resistance management of soybean looper in transgenic Bt cultivars. Scientific Reports 9, 199.

Rupula K, Kosuri T, Gul MZ, Sharma B and Beedu SR, 2019. Immuno-analytical method development for detection of transgenic Cry1Ac protein and its validation. Journal of the Science of Food and Agriculture 99, 6903-6910.

Salisu IB, Shahid AA, Yaqoob A, Rao AQ and Husnain T, 2019. Effect of dietary supplementation of recombinant Cry and Cp4 epsps proteins on haematological indices of growing rabbits. Journal of animal physiology and animal nutrition 103, 305-316.

Shahid AA, Salisu IB, Yaqoob A, Rao AQ, Ullah I and Husnain T, 2020. Assessing the fate of recombinant plant DNA in rabbit's tissues fed genetically modified cotton. Journal of animal physiology and animal nutrition 104, 343-351.

Shelton AM, Hossain MJ, Paranjape V, Prodhan MZH, Azad AK, Majumder R, Sarwer SH and Hossain MA, 2019. Bt Brinjal in Bangladesh: The First Genetically Engineered Food Crop in a Developing Country. Cold Spring Harbor perspectives in biology 11.

Siddiqui HA, Asif M, Asad S, Naqvi RZ, Ajaz S, Umer N, Anjum N, Rauf I, Sarwar M, Arshad M, Amin I, Saeed M, Mukhtar Z, Bashir A and Mansoor S, 2019. Development and evaluation of double gene transgenic cotton lines expressing Cry toxins for protection against chewing insect pests. Scientific Reports 9, 11774.

Sivamani E, Nalapalli S, Prairie A, Bradley D, Richbourg L, Strebe T, Liebler T, Wang D

and Que Q, 2019. A study on optimization of pat gene expression cassette for maize transformation. Molecular Biology Reports 46, 3009-3017.

Smith JL, Farhan Y and Schaafsma AW, 2019. Practical Resistance of Ostrinia nubilalis (Lepidoptera: Crambidae) to Cry1F Bacillus thuringiensis maize discovered in Nova Scotia, Canada. Scientific Reports 9, 18247.

Soares Figueiredo C, Nunes Lemes AR, Sebastiao I and Desiderio JA, 2019. Synergism of the Bacillus thuringiensis Cry1, Cry2, and Vip3 Proteins in Spodoptera frugiperda Control. Applied Biochemistry and Biotechnology 188, 798-809.

Song X, Chang L, Reddy GVP, Zhang L, Fan C and Wang B, 2019. Use of Taxonomic and Trait-Based Approaches to Evaluate the Effects of Transgenic Cry1Ac Corn on the Community Characteristics of Soil Collembola. Environmental Entomology 48, 263-269.

Song Y, Liu J and Chen F, 2020. Elevated CO2 not increased temperature has specific effects on soil nematode community either with planting of transgenic Bt rice or non-Bt rice. Peerj 8, e8547.

Song Y-Y, Liu J-W, Li L-K, Liu M-Q, Chen X-Y and Chen F-J, 2020. Evaluating the effects of transgenic Bt rice cultivation on soil stability. Environmental science and pollution research international 27, 17412-17419.

Souza CSF, Silveira LCP, Souza BHS, Nascimento PT, Damasceno NCR and Mendes SM, 2020. Efficiency of biological control for fall armyworm resistant to the protein Cry1F. Brazilian journal of biology = Revista brasleira de biologia.

Sun Y, Yang P, Jin H, Liu H, Zhou H, Qiu L, Lin Y and Ma W, 2020. Knockdown of the aminopeptidase N genes decreases susceptibility of Chilo suppressalis larvae to Cry1Ab/Cry1Ac and Cry1Ca. Pesticide Biochemistry and Physiology 162, 36-42.

Tabashnik BE and Carriere Y, 2019. Global Patterns of Resistance to Bt Crops Highlighting Pink Bollworm in the United States, China, and India. Journal of Economic Entomology 112, 2513-2523.

Tang Q, Yang Z, Han R, Zhang Y, Shen C and Wang J, 2019. No Effect of Bt-transgenic Rice on the Tritrophic Interaction of the Stored Rice, the Maize Weevil Sitophilus Zeamais and the Parasitoid Wasp Theocolax elegans. Scientific Reports 9, 4306.

Tessnow AE, Behmer ST and Sword GA, 2020. Protein-carbohydrate regulation and nutritionally mediated responses to Bt are affected by caterpillar population history. Pest Management Science.

Valadares NR, Soares MA, Ferreira EA, Mendes-Sa VG, Azevedo AM, Pires EM and Leite GLD, 2020. Behavior and development of Tetranychus ludeni Zacher, 1913 (Acari: Tetranychidae) and physiological stress in genetically modified cotton expressing Cry1F and Cry1Ac proteins. Brazilian journal of biology = Revista brasleira de biologia.

Vassallo CN, Figueroa Bunge F, Signorini AM, Valverde-Garcia P, Rule D and Babcock J, 2019. Monitoring the Evolution of Resistance in Spodoptera frugiperda (Lepidoptera: Noctuidae) to the Cry1F Protein in Argentina. Journal of Economic Entomology 112, 1838-1844.

Wang J-d, Zhang J-S, Guo Y-F, Chen L-F, Wang F-L, Huang M-T, Gao S-J and Wang R, 2019. Molecular cloning, characterization, and expression profiling analysis of Cry toxin receptor genes from sugarcane shoot borer Chilo infuscatellus (Snellen). Pesticide Biochemistry and Physiology 157, 186-195.

Wang L, Ma Y, Guo X, Wan P, Liu K, Cong S, Wang J, Xu D, Xiao Y, Li X, Tabashnik BE and Wu K, 2019. Pink Bollworm Resistance to Bt Toxin Cry1Ac Associated with an Insertion in Cadherin Exon 20. Toxins 11.

Wang L, Wang J, Ma Y, Wan P, Liu K, Cong S, Xiao Y, Xu D, Wu K, Fabrick JA, Li X and Tabashnik BE, 2019. Transposon insertion causes cadherin mis-splicing and confers resistance to Bt cotton in pink bollworm from China. Scientific Reports 9, 7479.

Wang Y, Quan Y, Yang J, Shu C, Wang Z, Zhang J, Gatehouse AMR, Tabashnik BE and He K, 2019. Evolution of Asian Corn Borer Resistance to Bt Toxins Used Singly or in Pairs. Toxins 11.

Wang Y, Wang J, Fu X, Nageotte JR, Silverman J, Bretsnyder EC, Chen D, Rydel TJ, Bean GJ, Li KS, Kraft E, Gowda A, Nance A, Moore RG, Pleau MJ, Milligan JS, Anderson HM, Asiimwe P, Evans A, Moar WJ, Martinelli S, Head GP, Haas JA, Baum JA, Yang F, Kerns DL and Jerga A, 2019. Bacillus thuringiensis Cry1Da_7 and Cry1B.868 Protein Interactions with Novel Receptors Allow Control of Resistant Fall Armyworms, Spodoptera frugiperda (J.E. Smith). Applied and Environmental Microbiology 85.

Wang J, Ma H, Zhao S, Huang J, Yang Y, Tabashnik BE and Wu Y, 2020. Functional redundancy of two ABC transporter proteins in mediating toxicity of Bacillus thuringiensisto cotton bollworm. PLoS Pathogens 16, e1008427.

Wang J, Xu D, Wang L, Cong S, Wan P, Lei C, Fabrick JA, Li X, Tabashnik BE and Wu K, 2020. Bt resistance alleles in field populations of pink bollworm from China: Similarities with the United States and decreased frequency from 2012 to 2015. Pest Management Science 76, 527-533.

Wang J, Zuo Y-Y, Li L-L, Wang H, Liu S-Y, Yang Y-H and Wu Y-D, 2020. Knockout of three aminopeptidase N genes does not affect susceptibility of Helicoverpa armigera larvae to Bacillus thuringiensis Cry1A and Cry2A toxins. Insect Science 27, 440-448.

Wang S and Wang P, 2020. Functional redundancy of structural proteins of the peritrophic membrane in Trichoplusia ni. Insect Biochemistry and Molecular Biology 125, 103456.

Wang X, Xu Y, Huang J, Jin W, Yang Y and Wu Y, 2020. CRISPR-Mediated Knockout of the ABCC2 Gene in Ostrinia furnacalis Confers High-Level Resistance to the Bacillus thuringiensis Cry1Fa Toxin. Toxins 12.

Wei J, Zhang M, Liang G and Li X, 2019. Alkaline phosphatase 2 is a functional receptor of Cry1Ac but not Cry2Ab in Helicoverpa zea. Insect Molecular Biology 28, 372-379.

Wei W, Pan S, Ma Y, Xiao Y, Yang Y, He S, Bravo A, Soberon M and Liu K, 2020. GATAe transcription factor is involved in Bacillus thuringiensis Cry1Ac toxin receptor gene expression inducing toxin susceptibility. Insect Biochemistry and Molecular Biology 118, 103306.

Wu AJ, Chapman K, Sathischandra S, Massengill J, Araujo R, Soria M, Bugas M, Bishop Z, Haas C, Holliday B, Cisneros K, Lor J, Canez C, New S, Mackie S, Ghoshal D, Privalle L, Hunst P and Pallett K, 2019. GHB614 * T304-40 * GHB119 * COT102 Cotton: Protein Expression Analyses of Field-Grown Samples. Journal of Agricultural and Food Chemistry 67, 275-281.

Xiao Y and Wu K, 2019. Recent progress on the interaction between insects and Bacillus thuringiensis crops. Philosophical transactions of the Royal Society of London Series B, Biological sciences 374, 20180316.

Xing Y, Qin Z, Feng M, Li A, Zhang L, Wang Y, Dong X, Zhang Y, Tan S and Shi W, 2019. The impact of Bt maize expressing the Cry1Ac protein on non-target arthropods. Environmental science and pollution research international 26, 5814-

5819.

Yan X, Lu J, Ren M, He Y, Wang Y, Wang Z and He K, 2020. Insecticidal Activity of 11 Bt toxins and 3 Transgenic Maize Events Expressing Vip3Aa19 to Black Cutworm, Agrotis ipsilon (Hufnagel). Insects 11.

Yang F, Gonzalez JCS, Williams J, Cook DC, Gilreath RT, Kerns and David L, 2019. Occurrence and Ear Damage of Helicoverpa zea on Transgenic Bacillus thuringiensis Maize in the Field in Texas, U.S. and Its Susceptibility to Vip3A Protein. Toxins 11.

Yang F, Gonzalez JCS, Little N, Reisig D, Payne G, Dos Santos RF, Jurat-Fuentes JL, Kurtz R and Kerns DL, 2020. First documentation of major Vip3Aa resistance alleles in field populations of Helicoverpa zea (Boddie) (Lepidoptera: Noctuidae) in Texas, USA. Scientific Reports 10, 5867.

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.

Zhang B, Guo W and Zhang T, 2019. Inheritance of Transgenes in Transgenic Bt Lines Resistance to Helicoverpa armigera in Upland Cotton. Methods in molecular biology (Clifton, NJ) 1902, 199-210.

Zhang M, Wei J, Ni X, Zhang J, Jurat-Fuentes JL, Fabrick JA, Carriere Y, Tabashnik BE and Li X, 2019. Decreased Cry1Ac activation by midgut proteases associated with Cry1Ac resistance in Helicoverpa zea. Pest Management Science 75, 1099-1106.

Zhang J, Jin M, Yang Y, Liu L, Yang Y, Gomez I, Bravo A, Soberon M, Xiao Y and Liu K, 2020. The Cadherin Protein Is Not Involved in Susceptibility to Bacillus thuringiensis Cry1Ab or Cry1Fa Toxins in Spodoptera frugiperda. Toxins 12.

Zhao C, Wu L, Luo J, Niu L, Wang C, Zhu X, Wang L, Zhao P, Zhang S and Cui J, 2020. Bt, Not a Threat to Propylea japonica. Frontiers in Physiology 11, 758.

Zhou L, Alphey N, Walker AS, Travers LM, Morrison NI, Bonsall MB and Raymond B, 2019. The application of self-limiting transgenic insects in managing resistance in experimental metapopulations. The Journal of applied ecology 56, 688-698.

Zhou J, Guo Z, Kang S, Qin J, Gong L, Sun D, Guo L, Zhu L, Bai Y, Zhang Z, Zhou X and Zhang Y, 2020. Reduced expression of the P-glycoprotein gene PxABCB1 is linked to resistance to Bacillus thuringiensis Cry1Ac toxin in Plutella xylostella (L.). Pest Management Science 76, 712-720.

Zhou X, Dong Y, Zhang Q, Xiao D, Yang M and Wang J, 2020. Expression of Multiple Exogenous Insect Resistance and Salt Tolerance Genes in Populus nigra L. Frontiers in Plant Science 11, 1123.

Zhu B, Sun X, Nie X, Liang P and Gao X, 2020. MicroRNA-998-3p contributes to Cry1Ac-resistance by targeting ABCC2 in lepidopteran insects. Insect Biochemistry and Molecular Biology 117, 103283.

Zubair M, Latif A, Rao AQ, Azam S, Shahid N, Samiullah TR, Yasmeen A, Shahid AA, Nasir IA and Husnain T, 2019. A Combinational Approach of Enhanced Methanol Production and Double Bt Genes for Broad Spectrum Insect Resistance in Transgenic Cotton. Molecular biotechnology 61, 663-673.

4. <u>Entries retrieved using Europe PMC</u>

De Cerqueira DT, Fast BJ, Silveira AC and Herman RA, 2019. Transgene-product expression levels in genetically engineered breeding stacks are equivalent to those of the single events. GM crops & food 10, 35-43.

Syed T, Askari M, Meng Z, Li Y, Abid MA, Wei Y, Guo S, Liang C and Zhang R, 2020. Current Insights on Vegetative Insecticidal Proteins (Vip) as Next Generation Pest

Killers. In: Toxins.

Verginelli D, Paternò A, De Marchis ML, Quarchioni C, Vinciguerra D, Bonini P, Peddis S, Fusco C, Misto M, Marfoglia 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.

Yang F, González JCS, Williams J, Cook DC, Gilreath RT, Kerns and David L, 2019. Occurrence and Ear Damage of Helicoverpa zea on Transgenic Bacillus thuringiensis Maize in the Field in Texas, U.S. and Its Susceptibility to Vip3A Protein. In: Toxins.

5. Entries retrieved using reference lists of opinions of regulatory bodies and screened on full text[2]

None

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

Abdelgaffar H, Perera OP and Jurat-Fuentes JL, 2020. ABC transporter mutations in Cry1F-resistant fall armyworm (Spodoptera frugiperda) do not result in altered susceptibility to selected small molecule pesticides. Pest Management Science.

Agrawal A, Venkatesan T, Ramasamy GG, Syamala RR, Muthugounder M and Rai A, Transcriptome alterations of field-evolved resistance inPectinophora gossypiellaagainst Bt Bollgard II cotton in India. Journal of Applied Entomology 12.

Akhtar ZR, Rasul A, Sagheer M, Ali A, Ashraf I, Saddiq B and Mansoor ul H, 2020. CHARACTERIZING THE MODE OF RESISTANCE INHERITANCE AND CROSS RESISTANCE IN PINK BOLLWORM AGAINST CRY1AC TOXIN AND ORGANOPHOSPHATE PESTICIDES IN PAKISTAN. Pakistan Journal of Agricultural Sciences 57, 1101-1106.

Ali Q, Salisu IB, Shahid AA, Liaqat A and Rao AQ, 2020. A 90-day subchronic toxicity study of transgenic cotton expressing Cry1Ac, Cry2A and CP4-EPSPS proteins in Sprague-Dawley rats. Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association 111783.

Alok D, Annapragada H, Singh S, Murugesan S and Singh NP, 2020. Symbiotic nitrogen fixation and endophytic bacterial community structure in Bt-transgenic chickpea (Cicer arietinum L). Scientific Reports 10, 12.

Amaral FSA, Guidolin AS, Salmeron E, Kanno RH, Padovez FEO, Fatoretto JC and Omoto C, 2020. Geographical distribution of Vip3Aa20 resistance allele frequencies in Spodoptera frugiperda (Lepidoptera: Noctuidae) populations in Brazil. Pest Management Science 76, 169-178.

Amin MR, Oh SD, Bae E, Park SY and Suh SJ, Impact of insect-resistant transgenic rice on above-ground non-target arthropods in Korea. Entomological Research 14.

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.

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-

[2] The time-period is applied post-hoc as described in Table 2

Biotechnology in Agriculture and the Food Chain 11, 206-214.

Baker GH, Tann CR, Verwey P and Lisle L, 2019. Do the plant host origins of Helicoverpa (Lepidoptera: Noctuidae) moth populations reflect the agricultural landscapes within which they are caught? Bulletin of Entomological Research 109, 1-14.

Bally J, Fishilevich E, Doran RL, Lee K, de Campos SB, German MA, Narva KE and Waterhouse PM, 2020. Plin-amiR, a pre-microRNA-based technology for controlling herbivorous insect pests. Plant Biotechnology Journal 18, 1925-1932.

Bilbo TR, Reay-Jones FPF and Greene JK, 2020. Evaluation of Insecticide Thresholds in Late-Planted Bt and Non-Bt Corn for Management of Fall Armyworm (Lepidoptera: Noctuidae). Journal of Economic Entomology 113, 814-823.

Bonilla-Barrientos O, Hernandez-Leal E, Verastegui-Chavez J, Maltos-Buendia J, Bautista-Ramirez E, Hernandez-Bautista A and Isidro-Requejo LM, 2020. PRODUCTIVITY AND FIBER QUALITY OF CONVENTIONAL COTTON VARIETIES AT THE COMARCA LAGUNERA, MEXICO. Revista Fitotecnia Mexicana 43, 3-9.

Britz C, Van den Berg J and Du Plessis H, 2020. Susceptibility of Spodoptera littoralis (Boisduval) (Lepidoptera: Noctuidae) to Bt cotton, expressing Cry1Ac and Cry2Ab toxins, in South Africa. African Entomology 28, 182-186.

Carlson AB, Mukerji P, Mathesius CA, Huang E, Herman RA, Hoban D, Thurman JD and Roper JM, 2020. DP-2O2216-6 maize does not adversely affect rats in a 90-day feeding study. Regulatory toxicology and pharmacology : RTP 117, 104779.

Carriere Y, Brown ZS, Downes SJ, Gujar G, Epstein G, Omoto C, Storer NP, Mota-Sanchez D, Sogaard Jorgensen P and Carroll SP, 2020. Governing evolution: A socioecological comparison of resistance management for insecticidal transgenic Bt crops among four countries. Ambio 49, 1-16.

Carriere Y, Degain BA, Harpold VS, Unnithan GC and Tabashnik BE, 2020. Gene Flow Between Bt and Non-Bt Plants in a Seed Mixture Increases Dominance of Resistance to Pyramided Bt Corn in Helicoverpa zea (Lepidoptera: Noctuidae). Journal of Economic Entomology.

Cherif A and Verheggen F, 2019. A review of Tuta absoluta (Lepidoptera: Gelechiidae) host plants and their impact on management strategies. Biotechnologie Agronomie Societe Et Environnement 23, 270-278.

Coates BS, Abel CA, Swoboda-Bhattarai KA, Palmquist DE, Montezano DG, Zukoff SN, Wang Y, Bradshaw JD, DiFonzo CD, Shields E, Tilmon KJ, Hunt TE and Peterson JA, 2020. Geographic Distribution of Bacillus thuringiensis Cry1F Toxin Resistance in Western Bean Cutworm (Lepidoptera: Noctuidae) Populations in the United States. Journal of Economic Entomology.

Crow W, Gore J, Catchot AL, Cook DR, Stewart SD, Seiter NJ, Studebaker G, Lorenz G, Kerns D, Brown S, Jones MM, Musser F and Towles T, 2020. Termination of Insecticide Applications for Tarnished Plant Bug (Hemiptera: Miridae) Management in Cotton. Journal of Cotton Science 24, 17-26.

De Cerqueira DT, Fast BJ, Silveira AC and Herman RA, 2019. Transgene-product expression levels in genetically engineered breeding stacks are equivalent to those of the single events. GM crops & food 10, 35-43.

de Souza MWR, Ferreira EA, dos Santos JB, Soares MA, Castro B and Zanuncio JC, 2020. Fluorescence of chlorophyll a in transgenic maize with herbicide application and attacked by Spodoptera frugiperda (Lepidoptera: Noctuidae). Phytoparasitica 48, 567-573.

Dessoky ES, Ismail RM, Elarabi NI, Abdelhadi AA and Abdallah NA, 2021. Improvement of sugarcane for borer resistance using Agrobacterium mediated transformation of

cry1Ac gene. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 12, 47-56.

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

Dong S, Gao MJ, Bo ZY, Guan LJ, Hu XD, Zhang HXY, Liu BB, Li P, He KL, Liu XJ and Zhang CZ, 2020. Production and characterization of a single-chain variable fragment antibody from a site-saturation mutagenesis library derived from the anti-Cry1A monoclonal antibody. International Journal of Biological Macromolecules 149, 60-69.

Dong S, Gao MJ, Guan LJ, Zhang HXY, Wang YL, Liu BB, Li P, Qiao K, Liu XJ and Zhang CZ, 2020. Construction, Expression, and Identification of Double Light Chain (V-L-V-L) Antibody from a Unique Bt Cry1-Specific Monoclonal Antibody. Food Analytical Methods 13, 1570-1582.

Duan H, Yang X, Bu Z, Li X, Zhang Z and Sun W, 2020. Identification and Characterization of Genes Involved in Ecdysteroid Esterification Pathway Contributing to the High 20-Hydroxyecdysone Resistance of Helicoverpa armigera. Frontiers in Physiology 11, 508.

Fabrick JA, LeRoy DM, Unnithan GC, Yelich AJ, Carriere Y, Li XC and Tabashnik BE, 2020. Shared and Independent Genetic Basis of Resistance to Bt Toxin Cry2Ab in Two Strains of Pink Bollworm. Scientific Reports 10, 11.

Fanela TLM, Baldin ELL, Hunt TE and Faria RD, 2020. Baseline Plant-to-Plant Larval Movement of Spodoptera eridania in Bt and Non-Bt Soybean and Its Possible Impacts on IRM. Journal of Economic Entomology 113, 1741-1752.

Fard ZM, Hesami S, Marzban R and Jouzani GS, 2020. Individual and Combined Biological Effects of Bacillus thuringiensis and Multicapsid Nucleopolyhedrovirus on the Biological Stages of Egyptian Cotton Leafworm, Spodoptera littoralis (B.) (Lep.: Noctuidae). Journal of Agricultural Science and Technology 22, 465-476.

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.

Figueiredo CS, Zara FJ and Desiderio JA, Effect of the Cry1, Cry2 and Vip3 protein combinations on the control ofAnticarsia gemmatalis(Erebidae) andChrysodeixis includens(Noctuidae) Lepidoptera. International Journal of Pest Management 9.

Fritz ML, Nunziata SO, Guo R, Tabashnik BE and Carriere Y, 2020. Mutations in a Novel Cadherin Gene Associated with Bt Resistance in Helicoverpa zea. G3-Genes Genomes Genetics 10, 1563-1574.

Fu JM and Liu B, 2020. Enhanced yield performance of transgenic cry1C* rice in saline-alkaline soil. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 11, 97-112.

Fu S, Liu ZX, Chen JZ, Sun GX, Jiang YX, Li MW, Xiong L, Chen SP, Zhou YQ, Asad M and Yang G, 2020. Silencing arginine kinase/integrin beta(1) subunit by transgenic plant expressing dsRNA inhibits the development and survival of Plutella xylostella. Pest Management Science 76, 1761-1771.

Gao JH, Qian HM, Guo XQ, Mi Y, Guo JP, Zhao JL, Xu C, Zheng T, Duan M, Tang ZW, Lin CY, Shen ZC, Jiang YW and Wang XC, 2020. The signal peptide of Cry1Ia can improve the expression of eGFP or mCherry in Escherichia coli and Bacillus thuringiensis and enhance the host's fluorescent intensity. Microbial Cell Factories 19, 19.

Ghazanfar MU, Hagenbucher S, Romeis J, Grabenweger G and Meissle M, 2020. Fluctuating temperatures influence the susceptibility of pest insects to biological control agents. Journal of Pest Science 93, 1007-1018.

Giron-Calva PS, Twyman RM, Albajes R, Gatehouse AMR and Christou P, 2020. The Impact of Environmental Stress on Bt Crop Performance. Trends in Plant Science 25, 264-278.

Gomez I, Ocelotl J, Sanchez J, Aguilar-Medel S, Pena-Chora G, Lina-Garcia L, Bravo A and Soberon M, 2020. Bacillus thuringiensis Cry1Ab domain III beta-22 mutants with enhanced toxicity to Spodoptera frugiperda (J. E. Smith). Applied and Environmental Microbiology.

Goncalves J, Rodrigues JVC, Santos-Amaya OF, Paula-Moraes SV and Pereira EJG, 2020. The oviposition behavior of fall armyworm moths is unlikely to compromise the refuge strategy in genetically modified Bt crops. Journal of Pest Science 93, 965-977.

Gong LJ, Kang S, Zhou JL, Sun D, Guo L, Qin JY, Zhu LH, Bai Y, Ye F, Akami M, Wu QJ, Wang SL, Xu BY, Yang ZX, Bravo A, Soberon M, Guo ZJ, Wen LZ and Zhang YJ, 2020. Reduced Expression of a Novel Midgut Trypsin Gene Involved in Protoxin Activation Correlates with Cry1Ac Resistance in a Laboratory-Selected Strain of Plutella xylostella (L.). Toxins 12, 15.

Guan F, Zhang JP, Shen HW, Wang XL, Padovan A, Walsh TK, Tay WT, Gordon KHJ, James W, Czepak C, Otim MH, Kachigamba D and Wu YD, Whole-genome sequencing to detect mutations associated with resistance to insecticides and Bt proteins inSpodoptera frugiperda. Insect Science 12.

Gulzar A, Mukhtar T and Wright DJ, 2020. Effects of entomopathogenic nematodes Steinernema carpocapsae and Heterorhabditis bacteriophora on the fitness of a Vip3A resistant subpopulation of Heliothis virescens (Noctuidae: Lepidoptera). Bragantia 79, 281-292.

Guo ZJ, Gong LJ, Kang S, Zhou JL, Sun D, Qin JY, Guo L, Zhu LH, Bai Y, Bravo A, Soberon M and Zhang YJ, 2020. Comprehensive analysis of Cry1Ac protoxin activation mediated by midgut proteases in susceptible and resistant Plutella xylostella (L.). Pesticide Biochemistry and Physiology 163, 23-30.

Gupta R, Baruah AM, Acharjee S and Sarmah BK, 2020. Compositional analysis of transgenic Bt-chickpea resistant to Helicoverpa armigera. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 11, 262-274.

Hao J, Gao M, Hu X, Lu L, Zhang X, Liu Y, Zhong J and Liu X, 2020. Synergistic selection of a Helicoverpa armigera cadherin fragment with Cry1Ac in different cells and insects. International Journal of Biological Macromolecules.

Huang FN, Resistance of the fall armyworm,Spodoptera frugiperda, to transgenicBacillus thuringiensisCry1F corn in the Americas: lessons and implications for Bt corn IRM in China. Insect Science 16.

Huang JL, Xu YJ, Zuo YY, Yang YH, Tabashnik BE and Wu YD, 2020. Evaluation of five candidate receptors for three Bt toxins in the beet armyworm using CRISPR-mediated gene knockouts. Insect Biochemistry and Molecular Biology 121, 9.

Huseth AS, D'Ambrosio DA and Kennedy GG, 2020. Understanding the potential impact of continued seed treatment use for resistance management in Cry51Aa2.834_16 Bt cotton against Frankliniella fusca. Plos One 15, e0239910.

Jadhav MS, Rathnasamy SA, Natarajan B, Duraialagaraja S and Varatharajalu U, 2020. Study of Expression of Indigenous Bt cry2AX1 Gene in T-3 Progeny of Cotton and its Efficacy Against Helicoverpa armigera (Hubner). Brazilian Archives of Biology

and Technology 63, 11.

Jalapathi SK, Jayaraj J, Shanthi M, Theradimani M, Venkatasamy B, Irulandi S and Prabhu S, 2020. Potential of Cry1Ac fromBacillus thuringiensisagainst the tomato pinworm,Tuta absoluta(Meyrick) (Gelechiidae: Lepidoptera). Egyptian Journal of Biological Pest Control 30, 4.

Jaleel W, Saeed S, Naqqash MN, Sial MU, Ali M, Zaka SM, Sarwar ZM, Ishtiaq M, Qayyum MA, Ul Aine Q, Anwar A, Sarmad M, Azad R, Latif M, Ahmed F, Islam W, Khan KA and Ghramh HA, 2020. Effects of temperature on baseline susceptibility and stability of insecticide resistance against Plutella xylostella (Lepidoptera: Plutellidae) in the absence of selection pressure. Saudi Journal of Biological Sciences 27, 1-5.

Jamil S, Shahzad R, Rahman SU, Iqbal MZ, Yaseen M, Ahmad S and Fatima R, 2021. The level of Cry1Ac endotoxin and its efficacy against H. armigera in Bt cotton at large scale in Pakistan. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 12, 1-17.

Jiang K, Zhang Y, Chen Z, Wu DL, Cai J and Gao X, 2020. Structural and Functional Insights into the C-terminal Fragment of Insecticidal Vip3A Toxin ofBacillus thuringiensis. Toxins 12, 15.

Jimenez-Chavez AdJ, Moreno-Fierros L and Bustos-Jaimes I, 2019. Therapy with multi-epitope virus-like particles of B19 parvovirus reduce tumor growth and lung metastasis in an aggressive breast cancer mouse model. Vaccine 37, 7256-7268.

Jung YJ, Yoo SH, Choi W, Lee JR and Moon JC, 2019. Purification of the Cry1Ac protein of Bacillus thuringiensis and assessment against the Plutella xylostella and soil microbial community. Entomological Research 49, 501-508.

Karar H, Bashir MA, Haider M, Haider N, Khan KA, Ghramh HA, Ansari MJ, Mutlu C and Alghanem SM, 2020. Pest susceptibility, yield and fiber traits of transgenic cotton cultivars in Multan, Pakistan. Plos One 15, 15.

Katta S, Talakayala A, Reddy MK, Addepally U and Garladinne M, 2020. Development of transgenic cotton (Narasimha) using triple gene Cry2Ab-Cry1F-Cry1Ac construct conferring resistance to lepidopteran pest. Journal of Biosciences 45, 11.

Kayam D, Tirupati MK and Karanam HP, 2020. Diversity of Bacillus thuringiensis cry genes in soils of Andhra Pradesh, India. Indian Journal of Biochemistry & Biophysics 57, 471-480.

Kim YJ, Kloos S, Romeis J and Meissle M, Effects of mCry51Aa2-producing cotton on the non-target spider miteTetranychus urticaeand the predatory bugOrius majusculus. Journal of Pest Science 12.

Kranthi KR and Stone GD, 2020. Long-term impacts of Bt cotton in India. Nature Plants 6, 188-+.

Krogh PH, Kostov K and Damgaard CF, The effect ofBtcrops on soil invertebrates: a systematic review and quantitative meta-analysis. Transgenic Research 12.

Krogh PH, Kostov K and Damgaard CF, 2020. The effect of Bt crops on soil invertebrates: a systematic review and quantitative meta-analysis. Transgenic Research.

Kumar R, Kranthi S, Rao G, Desai H, Bheemanna H, Dharajothi B, Choudhary A and Kranthi KR, Assessment of bollworm damage and yield loss in seed blends of Bollgard-II with corresponding Non-Bt hybrid as 'built in refuge' in cotton. Phytoparasitica 11.

Kuwardadra SI, Bhatt KC, Paliwal A, Sood P, Malav PK, Sodhi KK and Randhawa G, 2020. Monitoring adventitious presence of transgenes in brinjal (Solanum melongena L.) collections from the regions in India bordering Bangladesh: a case

report. Genetic Resources and Crop Evolution 67, 1181-1192.

Lawrie RD, Mitchell Iii RD, Deguenon JM, Ponnusamy L, Reisig D, Pozo-Valdivia AD, Kurtz RW and Roe RM, 2020. Multiple Known Mechanisms and a Possible Role of an Enhanced Immune System in Bt-Resistance in a Field Population of the Bollworm, Helicoverpa zea: Differences in Gene Expression with RNAseq. International journal of molecular sciences 21.

Li GP, Huang JR, Ji TJ, Tian CH, Zhao XC and Feng HQ, Baseline susceptibility and resistance allele frequency inOstrinia furnacalisrelated to Cry1 toxins in the Huanghuaihai summer corn region of China. Pest Management Science 7.

Li XW, Du LX, Zhang L, Peng YF, Hua HX, Romeis J and Li YH, ReducedMythimna separatainfestation onBtcorn could benefit aphids. Insect Science 8.

Li H, Zhang J, Ma T, Li C, Ma ZQ and Zhang X, 2020. Acting target of toosendanin locates in the midgut epithelium cells of Mythimna separate Walker larvae (lepidoptera: Noctuidae). Ecotoxicology and Environmental Safety 201, 6.

Li SZ, De Mandal S, Xu XX and Jin FL, 2020. The Tripartite Interaction of Host Immunity-Bacillus thuringiensisInfection-Gut Microbiota. Toxins 12, 17.

Li XY, Miyamoto K, Takasu Y, Wada S, Iizuka T, Adegawa S, Sato R and Watanabe K, 2020. ATP-Binding Cassette Subfamily a Member 2 Is a Functional Receptor for Bacillus thuringiensis Cry2A Toxins in Bombyx mori, But Not for Cry1A, Cry1C, Cry1D, Cry1F, or Cry9A Toxins. Toxins 12, 14.

Liu LP, Guo RQ, Qin Q, Fu JM and Liu B, 2020. Expression of Bt Protein in Transgenic Bt Cotton Plants and Ecological Fitness of These Plants in Different Habitats. Frontiers in Plant Science 11, 9.

Liu SY, Wang S, Wu SW, Wu YD and Yang YH, 2020. Proteolysis activation of Cry1Ac and Cry2Ab protoxins by larval midgut juice proteases from Helicoverpa armigera. Plos One 15, 10.

Liu WB, Wu LR, Wang J, Li XB, Jin XB and Zhu JY, 2020. Activity of Vip3Aa1 against Periplaneta americana. Open Life Sciences 15, 133-144.

Liu WX, Liu XR, Liu C, Zhang Z and Jin WJ, 2020. Development of a sensitive monoclonal antibody-based sandwich ELISA to detect Vip3Aa in genetically modified crops. Biotechnology Letters 42, 1467-1478.

Liu ZX, Fu S, Ma XL, Baxter SW, Vasseur L, Xiong L, Huang YP, Yang G, You SJ and You MS, 2020. Resistance toBacillus thuringiensisCry1Ac toxin requires mutations in twoPlutella xylostellaATP-binding cassette transporter paralogs. Plos Pathogens 16, 23.

Lohn AF, Trtikova M, Chapela I, Van den Berg J, du Plessis H and Hilbeck A, 2020. Transgene behavior inZea maysL. crosses across different genetic backgrounds: Segregation patterns,cry1Abtransgene expression, insecticidal protein concentration and bioactivity against insect pests. Plos One 15, 28.

Ma JH, Tian CY, Lyu GH and Mai WX, 2020. Does cotton bollworm show cross-resistance to the Bacillus thuringiensis toxins Cry1Ac and Cry2Ab? A mini review. Journal of Arid Land 12, 349-356.

Machado EP, Rodrigues GL, Somavilla JC, Fuhr FM, Zago SL, Marques LH, Santos AC, Nowatzki T, Dahmer ML, Omoto C and Bernardi O, Survival and development ofSpodoptera eridania,Spodoptera cosmioidesandSpodoptera albula(Lepidoptera: Noctuidae) on genetically-modified soybean expressingCry1AcandCry1Fproteins. Pest Management Science 7.

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.

Malaquias JB, Caprio MA, Godoy WAC, Omoto C, Ramalho FS and Pach JKS, 2020. Experimental and theoretical landscape influences on Spodoptera frugiperda movement and resistance evolution in contaminated refuge areas of Bt cotton. Journal of Pest Science 93, 329-340.

Mamta B, Santanu D, Handique PJ, Sumita A and Sarmah BK, 2020. Defense response in chickpea pod wall due to simulated herbivory unfolds differential proteome profile. Protein Journal 39, 240-257.

Mansoor MM and Shad SA, Inheritance of polygenic but stable pyriproxyfen resistance in a bio-control agentChrysoperla carnea(Neuroptera: Chrysopidae): cross-resistance and realized heritability. Pest Management Science 9.

Marotti I, Whittaker A, Benedettelli S, Dinelli G and Bosi S, 2020. Evaluation of the propensity of interspecific hybridization between oilseed rape (Brassica napus L.) to wild-growing black mustard (Brassica nigra L.) displaying mixoploidy. Plant Science 296, 9.

Mortazavi SE, Arabsalmani M and Khankahdani HH, 2019. Field evaluation of yield and lepidopteran pest resistance in three transgenic cotton lines. Journal of Plant Protection (Mashhad) 33, 431-440.

Moscardini VF, Marques LH, Santos AC, Rossetto J, Silva O, Rampazzo PE and Castro BA, 2020. Efficacy of Bacillus thuringiensis (Bt) maize expressing Cry1F, Cry1A.105, Cry2Ab2 and Vip3Aa20 proteins to manage the fall armyworm (Lepidoptera: Noctuidae) in Brazil. Crop Protection 137, 8.

Muralimohan N, Saini RP, Kesiraju K, Pattanayak D, Kumar PA, Kasturi K and Sreevathsa R, 2020. Molecular stacking of two codon-modified genes encoding Bt insecticidal proteins, Cry1AcF and Cry2Aa for management of resistance development in Helicoverpa armigera. Journal of Plant Biochemistry and Biotechnology 29, 518-527.

Muraro DS, Stacke RF, Cossa GE, Godoy DN, Garlet CG, Valmorbida I, O'Neal ME and Bernardi O, 2020. Performance of Seed Treatments Applied on Bt and Non-Bt Maize Against Fall Armyworm (Lepidoptera: Noctuidae). Environmental Entomology.

Murua MG, Vera MA, Michel A, Casmuz AS, Fatoretto J and Gastaminza G, 2019. Performance of Field-Collected Spodoptera frugiperda (Lepidoptera: Noctuidae) Strains Exposed to Different Transgenic and Refuge Maize Hybrids in Argentina. Journal of Insect Science 19, 7.

Nava-Camberos U, Teran-Vargas AP, Aguilar-Medel S, Martinez-Carrillo JL, Avila Rodriguez V, Rocha-Munive MG, Castaneda-Contreras S, Niaves-Nava E, Mota-Sanchez D and Blanco CA, 2019. Agronomic and environmental impacts of Bt cotton in Mexico. Journal of Integrated Pest Management 10, 15.

Nikhil R, Maniraj R, Shweta S, Karthik K, Vikraman M, Singh NK, Dash PK and Rohini S, 2020. Assessment of pigeonpea (Cajanus cajan L.) transgenics expressing Bt ICPs, Cry2Aa and Cry1AcF under nethouse containment implicated an effective control against herbivory by Helicoverpa armigera (Hubner). Pest Management Science 76, 1902-1911.

Niu L, Liu F, Zhang S, Luo JY, Zhang LJ, Ji JC, Gao XK, Ma WH and Cui JJ, 2020. Transgenic insect-resistant Bt cotton expressing Cry1Ac/CpTI does not affect the mirid bug Apolygus lucorum. Environmental Pollution 264, 9.

Niz JM, Salvador R, Ferrelli ML, de Cap AS, Romanowski V and Berretta MF, 2020.

Genetic variants in Argentinean isolates of Spodoptera frugiperda Multiple Nucleopolyhedrovirus. Virus Genes 56, 401-405.

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.

Pinos D, Chakroun M, Millan-Leiva A, Jurat-Fuentes JL, Wright DJ, Hernandez-Martinez P and Ferre J, 2020. Reduced Membrane-Bound Alkaline Phosphatase Does Not Affect Binding of Vip3Aa in aHeliothis virescensResistant Colony. Toxins 12, 12.

Portilla M, Blanco CA, Arias R and Zhu YC, 2020. Effect of Two Bacillus thuringiensis Proteins on Development of the Fall Armyworm after Seven-Day Exposure. Southwestern Entomologist 45, 389-403.

Qi LL, Qiu XF, Yang SS, Li R, Wu BB, Cao XM, He T, Ding XZ, Xia LQ and Sun YJ, 2020. Cry1Ac Protoxin and Its Activated Toxin from Bacillus thuringiensis Act Differentially during the Pathogenic Process. Journal of Agricultural and Food Chemistry 68, 5816-5824.

Rabelo MM, Matos JML, Orozco-Restrepo SM, Paula-Moraes SV and Pereira EJG, 2020. Like Parents, Like Offspring? Susceptibility to Bt Toxins, Development on Dual-Gene Bt Cotton, and Parental Effect of Cry1Ac on a Nontarget Lepidopteran Pest. Journal of Economic Entomology 113, 1234-1242.

Rabelo MM, Matos JML, Santos-Amaya OF, Franca JC, Goncalves J, Paula-Moraes SV, Guedes RNC and Pereira EJG, 2020. Bt-toxin susceptibility and hormesis-like response in the invasive southern armyworm (Spodoptera eridania). Crop Protection 132, 7.

Rabelo MM, Paula-Moraes SV, Pereira EJG and Siegfried BD, 2020. Demographic Performance of Helicoverpa zea Populations on Dual and Triple-Gene Bt Cotton. Toxins 12.

Rajput IA, Syed TS, Lodhi AM, Abro GH and Imran K, 2019. Comparative biology of pink bollworm, Pectinophora gossypiella Saund. on Bt. and non-Bt. cotton. Pakistan Journal of Scientific and Industrial Research, Series B: Biological Sciences 62, 116-121.

Ramos LN, Souza NOS and Vilela MS, 2020. AGRONOMIC PARAMETERS AND MORPHO-AGRONOMIC CHARACTERISTICS OF GENETICALLY MODIFIED MAIZE HYBRIDS COMPARED TO CONVENTIONAL MAIZE HYBRIDS. Bioscience Journal 36, 1156-1166.

Raper TB, Butler SA, Denton S, Steckel LE and Hayes RM, 2019. LibertyLink (R), WideStrike (R) and XtendFlex (R) Tolerance to Late Postemergence Applications of Glufosinate and S-Metolachlor. Journal of Cotton Science 23, 262-269.

Razaq M, Mensah R and Athar HUR, 2020. Insect Pest Management in Cotton. John Wiley & Sons Ltd, Chichester, 85-107

Reay-Jones FPF, Bilbo TR and Reisig DD, 2020. Decline in Sublethal Effects of Bt Corn on Corn Earworm (Lepidoptera: Noctuidae) Linked to Increasing Levels of Resistance. Journal of Economic Entomology.

Riaz S, Nasir IA, Bhatti MU, Adeyinka OS, Toufiq N, Yousaf I and Tabassum B, 2020. Resistance to Chilo infuscatellus (Lepidoptera: Pyraloidea) in transgenic lines of sugarcane expressing Bacillus thuringiensis derived Vip3A protein. Molecular Biology Reports 47, 2649-2658.

Riaz Marral MW, Khan MB, Ahmad F, Farooq S and Hussain M, 2020. The influence of transgenic (Bt) and non-transgenic (non-Bt) cotton mulches on weed dynamics, soil

properties and productivity of different winter crops. Plos One 15, e0238716.

Roomi R, Dahiya KK and Adesh K, 2020. Performance of different cotton cultivars against bollworms under unsprayed condition. Journal of Experimental Zoology, India 23, 135-139.

Rosolem CA, Sarto MVM, Rocha KF, Martins JDL and Alves MS, 2019. Does the introgression of Bt gene affect physiological cotton response to water deficit? Planta Daninha 37.

Rozadilla G, Cabrera NA, Virla EG, Greco NM and McCarthy CB, 2020. Gut microbiota of Spodoptera frugiperda (JE Smith) larvae as revealed by metatranscriptomic analysis. Journal of Applied Entomology 144, 351-363.

Sereno ML, Infante S, Cheavegatti-Gianotto A, Hjelle K, Lirette R, Cutri L, Rocha MS, Hjelle J and Cullis C, 2020. Evaluation of the effects of sugarcane processing on the presence of GM DNA and protein in sugar. Gm Crops & Food-Biotechnology in Agriculture and the Food Chain 11, 171-183.

Shabbir MZ, Zhang TT, Prabu S, Wang YQ, Wan ZY, Bravo A, Soberon M and He KL, 2020. Identification of Cry1Ah-binding proteins through pull down and gene expression analysis in Cry1Ah-resistant and susceptible strains of Ostrinia furnacalis. Pesticide Biochemistry and Physiology 163, 200-208.

Shankhu PY, Chetna M, Abhishek M, Doddachowdappa S, Somvanshi VS and Dutta TK, 2020. Txp40, a protein from Photorhabdus akhurstii, conferred potent insecticidal activity against the larvae of Helicoverpa armigera, Spodoptera litura and S. exigua. Pest Management Science 76, 2004-2014.

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.

Singh M, Randhawa G, Bhoge RK, Singh S, Kak A and Sangwan O, Monitoring Adventitious Presence of Transgenes in Cotton Collections from Genebank and Experimental Plots: Ensuring GM-Free Conservation and Cultivation of Genetic Resources. Agricultural Research 8.

Song YY, Liu JW and Chen FJ, 2020. Elevated CO2 not increased temperature has specific effects on soil nematode community either with planting of transgenic Bt rice or non-Bt rice. Peerj 8, 16.

Song YY, Liu JW, Li LK, Liu MQ, Chen XY and Chen FJ, 2020. Evaluating the effects of transgenic Bt rice cultivation on soil stability. Environmental Science and Pollution Research 27, 17412-17419.

Souza CSF, Silveira LCP, Souza BHS, Nascimento PT, Damasceno NCR and Mendes SM, 2020. Efficiency of biological control for fall armyworm resistant to the protein Cry1F. Brazilian journal of biology = Revista brasleira de biologia.

St Clair CR, Head GP and Gassmann AJ, 2020. Western corn rootworm abundance, injury to corn, and resistance to Cry3Bb1 in the local landscape of previous problem fields. Plos One 15, 22.

Su HH, Jiang T, Sun Y, Gu HJ, Wu JJ and Yang YZ, 2020. Effect of three insect-resistant maizes expressing Cry1le, Cry1Ab/Cry2Aj and Cry1Ab on the growth and development of armyworm Mythimna separata (Walker). Journal of Integrative Agriculture 19, 1842-1849.

Sun YJ, Yang P, Jin HH, Liu H, Zhou H, Qiu L, Lin YJ and Ma WH, 2020. Knockdown of the aminopeptidase N genes decreases susceptibility of Chilo suppressalis larvae to Cry1Ab/CrylAc and Cry1Ca. Pesticide Biochemistry and Physiology 162, 36-42.

Syed T, Askari M, Meng ZG, Li YY, Abid MA, Wei YX, Guo SD, Liang CZ and Zhang R, 2020. Current Insights on Vegetative Insecticidal Proteins (Vip) as Next Generation Pest Killers. Toxins 12, 24.

Tabashnik BE and Carriere Y, 2020. Evaluating Cross-resistance Between Vip and Cry Toxins of Bacillus thuringiensis. Journal of Economic Entomology 113, 553-561.

Talakayala A, Katta S and Garladinne M, 2020. Genetic engineering of crops for insect resistance: An overview. Journal of Biosciences 45, 12.

Tessnow AE, Behmer ST and Sword GA, Protein-carbohydrate regulation and nutritionally mediated responses to Bt are affected by caterpillar population history. Pest Management Science 8.

Torres Cabra E and Hernandez Fernandez JA, 2019. Larvicidal activity of Bacillus thuringiensis Colombian native strains against Bemisia tabaci (Hemiptera: Aleyrodidae). Journal of Plant Protection Research 59, 503-511.

Ullah MI, Muhammad A, Khan MI, Muhammad A, Khan AA, Zahid SMA, Muhammad S, Asad A, Saba K and Maryam R, 2019. Plant water stress affects the feeding performance of American bollworm, Helicoverpa armigera (Lepidoptera: Noctuidae) on cotton plants. Pakistan Journal of Agricultural Research 32, 625-628.

Ullah MI, Muhammad A, Khan MI, Muhammad A, Khan AA, Zahid SMA, Muhammad S, Asad A, Saba K and Maryam R, 2019. Plant water stress affects the feeding performance of American bollworm, Helicoverpa armigera (Lepidoptera: Noctuidae) on cotton plants. Pakistan Journal of Agricultural Research 32, 629-635.

Umer N, Naqvi RZ, Rauf I, Anjum N, Keen PR, Van Eck J, Jander G and Asif M, 2020. Expression of Pinellia ternata leaf agglutinin under rolC promoter confers resistance against a phytophagous sap sucking aphid, Myzus persicae. Electronic Journal of Biotechnology 47, 72-82.

Valadares NR, Soares MA, Ferreira EA, Mendes-Sa VG, Azevedo AM, Pires EM and Leite GLD, 2020. Behavior and development of Tetranychus ludeni Zacher, 1913 (Acari: Tetranychidae) and physiological stress in genetically modified cotton expressing Cry1F and Cry1Ac proteins. Brazilian journal of biology = Revista brasleira de biologia.

Verginelli D, Paternò A, De Marchis ML, Quarchioni C, Vinciguerra D, Bonini P, Peddis S, Fusco C, Misto M, Marfoglia 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.

Vinha FB, Silva BFBd, Masson MB and Pinto AdS, 2019. Comparison of Bt transgenic maize in control of Elasmopalpus lignosellus in the field. Scientia Agraria Paranaensis 18, 369-376.

Vonzun S, Messmer MM, Boller T, Shrivas Y, Patil SS and Riar A, 2019. Extent of Bollworm and Sucking Pest Damage on Modern and Traditional Cotton Species and Potential for Breeding in Organic Cotton. Sustainability 11, 12.

Wang BJ, Wei JZ, Wang YN, Chen L and Liang GM, 2020. Polycalin is involved in the toxicity and resistance to Cry1Ac toxin in Helicoverpa armigera (Hubner). Archives of Insect Biochemistry and Physiology 104, 12.

Wang J, Ma HH, Zhao S, Huang JL, Yang YH, Tabashnik BE and Wu YD, 2020. Functional redundancy of two ABC transporter proteins in mediating toxicity of Bacillus thuringiensis to cotton bollworm. Plos Pathogens 16, 15.

Wang SH and Wang P, 2020. Functional redundancy of structural proteins of the peritrophic membrane in Trichoplusia ni. Insect Biochemistry and Molecular Biology 125, 10.

Wang WJ, Cai WL, Wang ZJ, Zhao J and Hua HX, 2020. A new method for evaluating the effects of insecticidal proteins expressed by transgenic plants on ectoparasitoid of target pest. Environmental Science and Pollution Research 27, 29983-29992.

Wang XL, Xu YJ, Huang JL, Jin WZ, Yang YH and Wu YD, 2020. CRISPR-Mediated Knockout of the ABCC2 Gene in Ostrinia furnacalis Confers High-Level Resistance to the Bacillus thuringiensis Cry1Fa Toxin. Toxins 12, 12.

Wang ZJ, Cai WL, Wang WJ, Zhao J, Li YF, Zou YL, Elgizawy KK and Hua HX, 2020. Assessing the effects of Cry2Aa protein on Habrobracon hebetor (Hymenoptera: Braconidae), a parasitoid of Indian meal moth, Plodia interpunctella (lepidoptera: Pyralidae). Ecotoxicology and Environmental Safety 194, 7.

Wei W, Pan S, Ma YM, Xiao YT, Yang YB, He SJ, Bravo A, Soberon M and Liu KY, 2020. GATAe transcription factor is involved in Bacillus thuringiensis Cry1Ac toxin receptor gene expression inducing toxin susceptibility. Insect Biochemistry and Molecular Biology 118, 9.

Xiang Z, Feng TQ, Chen Z, Xin MY, Hua WC, Yuan C and Hua CD, 2019. Exogenous Hormones Affect Bt Protein Content of Two Bt Cotton Cultivars. Agronomy Journal 111, 3076-3083.

Xu J, Wang ZY, Wang YF, Ma HH, Zhu H, Liu J, Zhou Y, Deng XL and Zhou XM, 2020. ABCC2 participates in the resistance of Plutella xylostella to chemical insecticides. Pesticide Biochemistry and Physiology 162, 52-59.

Yan X, Lu J, Ren M, He Y, Wang Y, Wang Z and He K, 2020. Insecticidal Activity of 11 Bt toxins and 3 Transgenic Maize Events Expressing Vip3Aa19 to Black Cutworm, Agrotis ipsilon (Hufnagel). Insects 11, 10.

Yang F, Head GP, Price PA, Gonzalez JCS and Kerns DL, Inheritance of Bacillus thuringiensis Cry2Ab2 protein resistance in Helicoverpa zea (Lepidoptera: Noctuidae). Pest Management Science 9.

Yang F, Gonzalez JCS, Little N, Reisig D, Payne G, Dos Santos RF, Jurat-Fuentes JL, Kurtz R and Kerns DL, 2020. First documentation of major Vip3Aa resistance alleles in field populations of Helicoverpa zea (Boddie) (Lepidoptera: Noctuidae) in Texas, USA. Scientific Reports 10, 8.

Yang YJ, Xu H, Wu ZH and Lu ZX, 2020. pH influences the profiles of midgut extracts in Cnaphalocrocis medinalis (Guenee) and its degradation of activated Cry toxins. Journal of Integrative Agriculture 19, 775-784.

Yu S, Li S, Li HT, Liu RM and Gao JG, 2020. Bacillus thuringiensis Vip3Aa and Vip3Ad Chimeric Proteins Improve their Insecticidal Activity against Lepidopteran Insects. International Journal of Agriculture and Biology 23, 326-332.

Yunus FUN, Raza G, Makhdoom R and Zaheer H, 2019. Genetic improvement of Bacillus thuringiensis against the cotton bollworm, Earias vitella (Fab.) (Lepidoptera: Noctuidae), to improve the cotton yield in Pakistan. Egyptian Journal of Biological Pest Control 29, 6.

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.

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.

Zhang C, Wang J, Zhao J, Pang D, Zhang D and Yang M, 2019. Expression characteristics of Bt gene in transgenic poplar transformed by different multi-gene vectors. Scientia

Silvae Sinicae 55, 61-70.

Zhang JF, Jin MH, Yang YC, Liu LL, Yang YB, Gomez I, Bravo A, Soberon M, Xiao YT and Liu KY, 2020. The Cadherin Protein Is Not Involved in Susceptibility toBacillus thuringiensisCry1Ab or Cry1Fa Toxins inSpodoptera frugiperda. Toxins 12, 13.

Zhao CC, Wu LK, Luo JY, Niu L, Wang CP, Zhu XZ, Wang L, Zhao P, Zhang S and Cui JJ, 2020. Bt, Not a Threat toPropylea japonica. Frontiers in Physiology 11, 12.

Zhao XF, 2020. Progress in understanding hormonal regulation during the postembryonic development of Helicoverpa armigera. Journal of Integrative Agriculture 19, 1417-1428.

Zhao Y, Yun YL and Peng Y, 2020. Bacillus thuringiensis protein Vip3Aa does not harm the predator Propylea japonica: A toxicological, histopathological, biochemical and molecular analysis. Ecotoxicology and Environmental Safety 192, 5.

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.

Zhou H, Hu W, Huang Q, Abouzaid M, Jin H, Sun Y, Qiu L, Zhang W, Lin Y and Ma W, 2020. Knockdown of cadherin genes decreases susceptibility of Chilo suppressalis larvae to Bacillus thuringiensis produced Crystal toxins. Insect Molecular Biology 29, 301-308.

Zhou XL, Dong Y, Zhang Q, Xiao DD, Yang MS and Wang JM, 2020. Expression of Multiple Exogenous Insect Resistance and Salt Tolerance Genes inPopulus nigraL. Frontiers in Plant Science 11, 13.

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
Ali Q, Salisu IB, Shahid AA, Liaqat A and Rao AQ, 2020. A 90-day subchronic toxicity study of transgenic cotton expressing Cry1Ac, Cry2A and CP4-EPSPS proteins in Sprague-Dawley rats. Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association 111783.	Intervention/Exposure (not on the authorised GM cotton)
Liu LP, Guo RQ, Qin Q, Fu JM and Liu B, 2020. Expression of Bt Protein in Transgenic Bt Cotton Plants and Ecological Fitness of These Plants in Different Habitats. Frontiers in Plant Science 11, 9.	Intervention/Exposure (not on the authorised GM cotton)

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