



Sweet Corn

Strategic Agrichemical Review Process
(SARP)

August 2021

Hort Innovation
Project – VG18004

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VG18004 – Vegetable Strategic Agrichemical Review Process (SARP) Report Updates

SARP Service Provider:

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Purpose of the report:

This report was funded by Hort Innovation to investigate the pest problem, agrichemical usage and pest management alternatives for the Sweet corn industry across Australia. The information in this report will assist the industry with its agrichemical selection and usage into the future.

Date of report:

August 2021.

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**Hort
Innovation**
Strategic levy investment

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FUND**

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1. Summary

The strategic levy investment project Vegetable Industry SARP Report Updates (VG18004) is part of the Hort Innovation Vegetable Fund. A Strategic Agrichemical Review Process (SARP), through the process of a desktop audit and industry liaison;

- (i) Assesses the importance of the diseases, insects and weeds (plant pests) that can affect a horticultural industry;
- (ii) Evaluates the availability and effectiveness of fungicides, insecticides and herbicides (pesticides) to control the plant pests;
- (iii) Determines any gaps in the pest control strategy and
- (iv) Identifies suitable new or alternatives pesticides to address the gaps.

Alternative pesticides should ideally be selected for benefits of:

- Integrated Pest Management (IPM) compatibility
- Improved scope for resistance management
- Sound biological profile
- Residue and trade acceptance domestically and for export

The results of this process will provide the sweet corn industry with sound pesticide usage for the future that the industry can pursue for registration with the manufacturer, or minor-use permits with the Australian Pesticide and Veterinary Medicines Authority (APVMA).

1.1 Diseases

The high priority diseases are:

Common name	Scientific name
Northern / Turcicum Leaf Blight	<i>Exserohilum turcicum</i>
Rust - Common	<i>Puccinia sorghi</i>
Rust - Tropical / Polysora	<i>Puccinia polysora</i>

1.2 Insects and mites

The high priority insect and mite pests are:

Common name	Scientific name
Cotton Bollworm / Corn Earworm	<i>Helicoverpa armigera</i>
Fall Armyworm	<i>Spodoptera frugiperda</i>
Armyworm	<i>Mythimna convecta</i> , <i>Spodoptera exempta</i> , <i>Persectania ewingii</i>
Corn Aphid	<i>Rhopalosiphum maidis</i>
Green Peach Aphid	<i>Myzus persicae</i>

1.3 Weeds

There were no high priority weeds, but the following were rated as a moderate priority:

Common name	Scientific name
Nutgrass	<i>Cyperus rotundus</i>
Johnson Grass	<i>Sorghum halepense</i>
Fat Hen	<i>Chenopodium album</i>

2. The Australian Sweet Corn Industry

The Australian sweet corn industry is a minor horticultural industry.

Sweet corn is a summer vegetable crop, grown widely for both fresh market use and for processing as kernels and frozen cobs.

The major production areas of sweet corn include the Bundaberg and the Burdekin/Bowen region in Queensland; Riverina and Sydney Basin region in New South Wales; Gippsland region of Victoria and Gingin of Western Australia.

Production of sweet corn for the year ending June 2020¹ was 73,212 tonnes with a total value estimated at \$113.8 m.

Fifty five percent of sweet corn is sent for processing and forty five percent is sold as fresh supply. Australia does not export sweet corn.

Due to Australia’s varying weather conditions and the introduction of different varieties of sweet corn, the Australian industry is now able to supply domestic markets with fresh sweet corn throughout the year.

Fresh Sweet Corn Seasonality by State

State	19/20 t	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
New South Wales	17,375												
Victoria	9,114												
Queensland	46,499												
Western Australia	224												
South Australia	1												
Availability legend			High		Medium		Low						None

¹ Hort Innovation (2020). Australian Horticulture Statistics Handbook 2019/20. [online] Available at: <https://www.horticulture.com.au/globalassets/hort-innovation/resource-assets/ha18002-australian-horticulture-statistics-handbook-2019-20-vegetables.pdf>

3. Introduction

3.1 Background

Growers of some horticultural crops suffer from a lack of legal access to crop protection products (pesticides). The problem may be that whilst a relatively small crop area is valuable in an agricultural sense, it may not be of sufficient size for Agrichemical companies to justify the expense of registering a product use on that crop. Alternately, the disease, pest, or weed problem may be regional or spasmodic, making Agrichemical companies unwilling to bear the initial high cost of registering suitable pesticides.

Growers may face severe losses from diseases, pests and weeds due to a lack of registered or approved (via a permit) chemical control tools. Environmental concerns, consumer demands, and public opinion are also significant influences in the marketplace related to pest management practices. Industry IPM practitioners must strive to implement best management practices and tools to incorporate a pest management regime where strategies work in harmony with each other to achieve the desired effects while posing the least risks.

In combination with cultural practices, pesticides are important tools in sweet corn production and respective IPM programs. They control the various diseases, insects and weeds that affect the crop and can cause severe economic loss in modern high intensity growing operations. Pesticides are utilised during establishment and development, and to maximise quality and customer appeal.

As a consequence of the issues facing the sweet corn industry regarding pesticide access, Hort Innovation undertook a review of the pesticide requirements via a Strategic Agrichemical Review Process (SARP) in 2014. The current project is to update the SARP with the latest information and progress.

The SARP process identifies diseases, insect pests and weeds of major concern to the sweet corn industry. Against these threats, available registered or permitted pesticides are evaluated for overall suitability in terms of IPM, resistance, efficacy, trade, human safety and environmental issues. Where tools are unavailable or unsuitable the process aims to identify potential future solutions. Potential new risks to the industry are also identified.

The results will provide the sweet corn industry with a clear outlook of gaps in existing pest control options. This report is not a comprehensive assessment of ALL pests and control methods used in sweet corn but attempts to prioritise the major problems.

Exotic plant pests, not present in Australia, are not addressed in this document. A biosecurity plan has been developed for the Vegetable Industry in consultation with industry, government and scientists. The Biosecurity Plan² for the Vegetable Industry which covers sweet corn outlines key threats to the industry, risk mitigation plans, identification and categorisation of exotic pests and contingency plans. High priority exotic pests have been assessed based on their potential to enter, establish, and spread in Australia (e.g. environmental factors, host range, vectors) and the cost to industry of control measures.

² <https://ausveg.com.au/app/uploads/2018/06/Industry-Biosecurity-Plan-for-the-Vegetable-Industry.pdf>

3.2 Minor use permits and registration

According to the APVMA Guidelines for Determining Minor Uses, Sweet corn is considered a minor crop, as it is not listed as a major commodity under Schedule 1. The crop fits within the APVMA Crop Group 020 (Cereal grains) – Sub-group 020F (Sweet corns) and the APVMA Crop Group 012 Fruiting Vegetables, other than Cucurbits, with the following CODEX codes.

GC 2090 - includes all commodities in sub-group 020F.

GC 3081 - includes baby corn (*Zea mays L.*, several cultivars)

GC 0447 - Sweet corn (Corn-on-the-cob) (kernels plus cob with husk removed)
(*Zea mays L.*, several cultivars, not including popcorn)

GC 1275 - Sweet corn (whole kernel without cob or husk)
(*Zea mays L.*, several cultivars, not including popcorn)

VO 0050 – Fruiting Vegetables, other than Cucurbits

Popcorn is in a different sub-group - Maize cereals 020E.

Although sweet corn is classified as a minor crop and largely sold as a fresh vegetable or processed as kernels and frozen cobs for human consumption, access to minor use permits may not be straight forward if the crop products (trash, husks, cobs) are to be used in animal feed. In such situations, MRLs need to be established for crop products used in animal feed.

Therefore, access to minor use permits can be difficult and permit requests need to be in accordance with the APVMA's minor use guidance³.

Possible justification for future permit applications could be based on:

- New disease, insect or weed identified as a cropping issue
- No pesticide approved for the problem
- Insufficient options for resistance management
- Current pesticides ineffective due to resistance
- Trade risk - current pesticides unsuitable where crop commodities will be exported
- IPM, environment or OH&S issues
- Loss of pesticides due to removal from market or chemical review restrictions
- Opportunity to extrapolate a use pattern when a new, effective pesticide is registered in another crop
- Alternate pesticide has overseas registration or minor use permit
- Market failure – insufficient return on investment for registrant.

With each of these options, sound, scientific argument is required to justify any new permit applications. Another option for the sweet corn industry is for manufacturers to register new pesticides uses in the crop.

³ <https://apvma.gov.au/node/10931>

3.3 Methods

The current update of the Sweet Corn Strategic Agrichemical Review Process (SARP), which was last updated in 2014, was conducted by desktop audit using industry information gathered during 2011-2014 under MT10029 – Managing pesticide access in horticulture and finalised under VG12081 - Review of vegetable SARP reports. The process included gathering, collating and confirming information:

Hort Innovation Project Reference	Process of Review - Activity
VG16060 - Vegetable Agrichemical Pest Management Needs and Priorities (AUSVEG) - Commenced: 2 May 2017	<p>Engagement and consultation with growers and other relevant stakeholders. Including; Online crop specific surveys, workshops and one on one consultation Nationally.</p> <p>Collation of information collected by commodity on applicable pests, diseases and weeds in order of priority.</p>
MT17019 – Regulatory Support & Co-ordination (AKC)	<p>Sweet corn Agrichemical Regulatory Risk Assessment Document</p> <p>To assist strategic planning, with respect to future pest management options, this document was developed as part of the Hort Innovation funded project MT17019 to highlight the regulatory threats to agrichemicals currently approved for the management of the pests and diseases in sweet corn as well as current initiatives aimed at addressing identified pest management deficiencies.</p>
VG18004 – Vegetable Strategic Agrichemical Review Process (SARP) Report Updates	<p>SARP updated via a desktop audit:</p> <ul style="list-style-type: none"> • Review list of priorities ranked as high, moderate and low for each plant pest groups (disease, insects and weeds) – provided by VG16060 • Identify industries pest priority gaps in order of importance • Update current pesticides available via label registrations or minor use permits • Update available pesticide use patterns, IPM ranking/compatibility, mode of action and chemical group. • Identify pesticides at risk (under review and/or limited uses) via MT17019 Regulatory Support & Co-ordination – AKC consulting. • Identify any appropriate solutions through the outcomes of the AgChem Forum’s or similar market intelligence and their overall suitability (IPM compatibility, Chemical group to manage resistance, risk profile, existing domestic MRL’s or global MRL’s including any potential trade barriers, efficacy, OH&S, environmental safety and sustainability). • Include known pesticide solutions that are currently under development with registrants for new uses in the nominated crops or in current Hort Innovation projects. • Update MRL tables to include Australian MRL’s, Codex and any applicable export market MRL’s

3.4 Results and discussions

3.4.1 Detail

Results and discussions are presented in the body of this document.

3.4.2 Appendices

Refer to additional information in the appendices:

Appendix 1. Products available for disease control in sweet corn

Appendix 2. Products available for control of insects and mites in sweet corn

Appendix 3. Products available for weed control in sweet corn

Appendix 4. Current permits for use in sweet corn

Appendix 5. Sweet corn Maximum Residue Limits (MRLs)

Appendix 6. Sweet corn Agrichemical Regulatory Risk Assessment

4. Diseases, pests and weeds of sweet corn

Resistance management: To manage the risk of resistance development, integrated disease/pest/weed management (IDM/IPM/IWM) strategies should be adopted. The general principle is to integrate diverse chemical and non-chemical strategies; maximise efficacy; not rely on singular tools and rotate between different modes of action. It is always essential to follow all the label instructions. Specific resistance management strategies may apply. These can be found, along with other useful information, on the CropLife Australia website⁴.

In chapter 4, information on regulatory risk derived from project MT17019 - Regulatory support and coordination (Appendix 6) has been incorporated.

Some of the suggested options have no overseas MRLs (see Appendix 5). If treated fruit is to be exported nil residues at harvest would be needed for these options.

While care has been taken to ensure the accuracy of the information provided in this document the APVMA registered label and where relevant the APVMA approved permit must always be followed.

⁴ <https://www.croplife.org.au/resources/programs/resistance-management/>

4.1 Diseases of sweet corn

4.1.1 Disease priorities

Common name	Scientific name
High	
Northern / Turcicum Leaf Blight	<i>Exserohilum turcicum</i>
Rust - Common	<i>Puccinia sorghi</i>
Rust - Tropical / Polysora	<i>Puccinia polysora</i>
Moderate	
Java Downy Mildew	<i>Peronosclerospora maydis</i>
Damping Off	<i>Pythium spp., Fusarium spp., Sclerotium rolfsii, Rhizoctonia solani</i>
Boil Smut	<i>Ustilago maydis</i>
Fusarium Cob Rot	<i>Fusarium vertilliodes, F. spp.</i>
Head Smut	<i>Sporisorium reilianum</i>
Virus - Johnson Grass Mosaic	<i>JGMV</i>
Southern Leaf Blight	<i>Bipolaris maydis</i>
Wallaby Ear	Source of infection from toxin injected by Maize Leafhoppers (<i>Cicadulina bimaculata</i>) induced phytotoxemia
Low	
Bacterial Leaf Streak	<i>Xanthomonas campestris</i>
Charcoal Rot	<i>Macrophomina phaseolina</i>

The primary diseases of sweet corn can be divided into three types:

1. Fungal diseases, which include head Smut, Boil Smut, Downy Mildew, Northern (Turcica) Leaf Blight, Maydis Leaf Blight, seedling diseases (Pythium and Fusarium), stalk rots (Fusarium), ear rots (Fusarium) and storage rots.
2. Bacterial diseases such as Soft Rot of plant tops.
3. Viral diseases including Maize Dwarf Mosaic Virus, Wallaby Ear, and Sugarcane/Johnson Grass Mosaic Virus.

Diseases such as Rust and Northern Leaf Blight can also occur and cause considerable damage to sweet corn. Hybrid cultivars which are resistant/tolerant to these diseases are available. Ensure weed populations are kept in check and/or monitored particularly for aphids, which can cause infection. Ensure seed is treated with recommended fungicides and have a clear understanding of Boil Smut quarantine areas and requirements. For more information, refer to NSW DPI Primefact 247 (Boil Smut of corn)⁵.

⁵ http://archive.dpi.nsw.gov.au/_data/assets/pdf_file/0010/107929/boil-smut-of-corn.pdf

Resistance Management

Resistance management options are limited by the small range of fungicides available for use in sweet corn. Cultural control measures should be used to reduce reliance on fungicides for managing disease.

4.1.2 Available and potential products for priority diseases

TABLE KEY: Note that blank fields in the table indicate no information has been provided.

Availability		Regulatory risk (refer to Appendix 6)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Northern / Turcicum Leaf Blight (<i>Exserohilum turcicum</i>)							
Priority: High							
Turcicum Leaf Blight was ranked as a high priority in Vic, QLD, WA & NSW and a low priority in TAS. Variety related issue which can cause significant crop losses. Disease is favoured by warm, wet weather and is prevalent with heavy dews and overhead irrigation. Spores can survive on crop residues and volunteers and are spread by wind and irrigation water. Management should focus on farm hygiene, use of resistant varieties and avoiding crops maturing in warm, humid weather if possible.							
Azoxystrobin + Cyproconazole (Amistar Xtra) Syngenta	11+3	Protectant & Curative	14 G:14	A	ALL	Registered in sweet corn for control of Turcica Leaf Blight , Common Rust and Polysora Rust. [Max no. of applications not specified; min. re-treatment interval 21 d] Outcome of Hort Innovation project ST17000	R3
Chlorothalonil (Bravo)	M5	Protectant	1	A	ALL	Registered in sweet corn for control of Turcicum Leaf Blight . Apply as soon as conditions favour disease development. Not highly effective under high disease pressure. [Max no. of applications not specified; re-treatment interval 7-10 d]	R3
Propiconazole (Tilt) PER13116	3	Protectant & Curative	28 G:28	A	ALL	Permitted for use in sweet corn for control of Northern Corn Leaf Blight . [Max 2 applications per crop; re-treatment interval 14 d].	R3
Flutriafol	3	Protectant & Curative		P		US registration for control of Southern Corn Leaf Blight, Northern Corn Leaf Blight , Common Rust, Head Smut and Common Smut.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Rust - Common (<i>Puccinia sorghi</i>) Rust - Tropical / Polysora (<i>Puccinia polysora</i>) Priority: High							
Common Rust was ranked as a high priority issue in VIC, QLD & NSW, as a moderate priority in TAS and as a low priority in WA. Disease is favoured by warm weather combined with high humidity or heavy dews. Spores can survive on crop residues and volunteers and are easily spread by wind and can disperse long distances. Some sweet corn varieties are resistance to Common Rust. Management should focus on farm hygiene, use of resistant varieties and avoiding crops maturing in warm, humid weather if possible. Polysora can be distinguished from common rust by its lighter colour, absence from lower leaf surfaces and presence on stems							
Azoxystrobin + Cyproconazole (Amistar Xtra) Syngenta	11+3	Protectant & Curative	14 G:14	A	ALL	Registered in sweet corn for control of Turcica Leaf Blight, Common Rust and Polysora Rust . [Max no. of applications not specified; min. re-treatment interval 21 d] Outcome of Hort Innovation project ST17000	R3
Azoxystrobin + Tebuconazole (Veritas) Adama PER86245	11+3	Protectant & Curative	7 G:7	A	ALL (excl. VIC)	Permitted for use in sweet corn for control of Maize rust . [Max 3 applications per crop, 2 consecutive; re-treatment interval 7-14 d].	R3
Propiconazole (Tilt) Syngenta	3	Protective & curative	28 G:28	P-A	ALL	Permitted to use on sweet corn for control of Northern Corn leaf blight (PER13116). Registered in oats and barley crops for control of Maize Rust (<i>Puccinia</i> spp.)	R3
Pydiflumetofen +Difenoconazole (Miravis Duo) Syngenta	7+3	Protectant & Curative		P		Submitted for registration in June 2021 for control of various diseases in fruiting vegetables, cucurbits, root vegetables, celery and peanuts. US registration for control of Rust in stone fruit.	R3
Fluopyram + Tebuconazole (Luna Experience) Bayer	3+7	Protective		P		Registered in Australia for control of Yellow sigatoka, Leaf speckle and Cordana leaf spot in bananas. The US label is for use in almond, Brassica leafy vegetables, legume vegetables, melons & various fruit crops for control of a variety of diseases including powdery mildew, Alternaria leaf spot, gummy stem blight, Septoria, Botrytis, Cladosporium, Cercospora, Sclerotinia, Rust and Anthracnose and suppression of Rhizoctonia.	R3
Flutriafol	3	Protectant & Curative		P		US registration for control of Southern Corn Leaf Blight, Northern Corn Leaf Blight, Common Rust , Head Smut and Common Smut.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Java Downy Mildew (<i>Peronosclerospora maydis</i>)							
Priority: Moderate							
Java Downy Mildew was ranked as moderate priority in VIC and as a low priority in QLD, WA, TAS & NSW. The disease was considered a major to moderate problem in the 2014 SARP, especially in coastal regions of NSW and QLD. It can lead to significant plant losses, especially in warm, humid regions. The disease is systemic, and plants are infested soon after emergence. Seed treatments are an effective control measure.							
Metalaxyl-M (Apron)	4	Protectant & Curative	NR	A	QLD, TAS, WA & NT	Registered in sweet corn as a seed treatment for control of Downy Mildew . Sow seeds within 6 months of treatment.	-
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered in tomatoes for the suppression of Bacterial Speck, Bacterial Spot, Bacterial Canker and Powdery Mildew. US registration for control of Downy Mildew in Brassica leafy vegetables, cucurbits, leafy vegetables, spinach, and suppression of Downy Mildew in bulb onion.	-
Azoxystrobin + Oxathiapiprolin (Orondis Flexi) Syngenta	11+49	Protectant & Curative		P		Registered for control of Downy Mildew in brassica vegetables, bulb vegetables, cucurbits, endive, leafy vegetables, lettuce, onion and poppy.	-
Copper	M1	Protectant		P		Registered for the control of Downy Mildew in brassica vegetables, cucurbits, grapes, lettuce, onion, ornamentals, red beet, rhubarb, silverbeet and spinach.	-
Cyazofamid (Ranman) UPL	21	Protectant		P		Registered for control of Late Blight in potatoes and White Blister in broccoli, Downy Mildew in Brassica seedlings and Brassica leafy seedlings. As a result of the APVMA permit to label project, Pythium damping off in spinach & silverbeet and other uses covered under permits are now on the registered label. US registration for control of Downy Mildew in herbs, brassica leafy vegetables, cucurbits, grapes, hops, leafy greens, succulent-podded and succulent-shelled beans and bulb vegetables.	-
Dimethomorph (Acrobat) BASF	40	Protectant & Curative		P		Registered for control of Downy Mildew in cucurbits, grapes, lettuce, onion and poppy oilseed.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Dimethomorph + Amitoctradin (Zampro) AgNova	40+45	Protectant		P		Registered for control of Downy Mildew in grape vines. Pending label extension for control of Downy Mildew in grapes, bulb onion, spring onion, leafy vegetables including head lettuce and brassica leafy vegetables, cucurbits, beetroot and poppies.	-
Hydrogen Peroxide + Peroxyacetic Acid (Peratec Plus)	M	Protectant		P		Registered for control of Downy Mildew in brassica vegetables, bulb vegetables and grapes.	-
Mandipropamid (Revus) Syngenta	40	Protectant & Curative		P		Registered for control of Downy Mildew in Brassica leafy vegetables, grapes, leafy vegetables, lettuce, poppy oilseed, rocket, silverbeet and spinach.	-
Oxathiapiprolin (Zorvec Enicade) Corteva	49	Protectant		P		Registered for control of Downy Mildew in bulb vegetables, brassica vegetables, cucurbits, leafy vegetables, brassica leafy vegetables and poppies.	-
Oxathiapiprolin + Mancozeb (Zorvec Enibel) Corteva	49+M3	Protectant		P		Submitted for registration in June 2021 for control of various diseases including Downy Mildew in vegetables and poppies.	R2
Phosphorous Acid	33	Curative		P		Registered for control of Downy Mildew in grapes, cucurbits and poppies.	-
Polyoxin-D (Intervene) Nufarm	19	Protectant		P		Pending registration for control of Botrytis and Powdery Mildew in grapes, Botrytis, Powdery Mildew and Rhizopus Fruit Rot in berries, and Powdery Mildew, Alternaria and Fruit Spot in apples. US registration for control of Downy Mildew in ornamentals.	-
Propamocarb Hydrochloride + Fluopicolide (Infinito) Bayer	28+43	Protectant		P		Registered for the control of Downy Mildew in brassica vegetables, bulb vegetables, cucumber, cucurbits, leafy vegetables, lettuce, poppy and potatoes.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Damping Off (<i>Pythium</i> spp., <i>Fusarium</i> spp.) Priority: Moderate							
Damping Off was ranked as a moderate priority in VIC, QLD, WA & NSW and as a low priority in TAS. The disease attacks seedlings at the 1-2 leaf stage, causing water-soaked lesions on the stem and roots. Spores are carried over in undecomposed crop residues and infection is favoured by wet soil conditions. The fungi responsible for Damping Off can survive in the soil for extended periods, either as resting spores or in crop residues.							
1,3-Dichloropropene + Chloropicrin (Telone C-35)	8B	Fumigant	NR	A	ALL	Registered in vegetables for pre-planting control of Soil-Borne Diseases, including <i>Fusarium</i> , <i>Verticillium</i> Wilts, <i>Rhizoctonia</i> and <i>Pythium</i> . <i>For use by professional and registered fumigators only.</i>	-
Carboxin + Thiram (Vitavax)	7+M3	Protectant & Curative	NR	A	ALL	Registered in sweet corn as a seed treatment for the control of Boil Smut, Seedborne Head Smut and Seed Decay / Seedling Blight Complex (<i>Rhizoctonia</i> , <i>Fusarium</i> & <i>Pythium</i> spp.) Coverage of all seeds is essential. Treated seeds should not be held for the next season.	R2
Fludioxonil (Maxim 100FS) Syngenta	12	Protectant & Curative	NR	A	ALL	Registered in sweet corn as a seed treatment for the control of Damping Off caused by <i>Fusarium</i> spp. Coverage of all seeds is essential.	R3
Fludioxonil + Metalaxyl-M (Maxim XL) Syngenta	12+4	Protectant & Curative	NR	A	ALL	Registered in sweet corn as a seed treatment for the control of Damping Off caused by <i>Pythium</i> and <i>Fusarium</i> spp. Coverage of all seeds is essential.	R3
Metham Sodium	-	Fumigant	NR	A	ALL	Registered in food crops as a pre-plant fumigant for control of fungus diseases including <i>Rhizoctonia</i> , <i>Pythium</i> , <i>Fusarium</i> , <i>Phytophthora</i> , <i>Verticillium</i> , <i>Sclerotinia</i> and Club Root of crucifers. Applied as a soil injection, soil surface spray in front of a rotary tiller or through approved trickle irrigation systems.	-
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in vegetables for application to soil to improve bioavailability of soil resources to horticultural crops.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Bacillus amyloliquefaciens</i> (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of <i>Botrytis</i> in grapes. US registration for control of Pythium Damping Off in artichoke, asparagus, brassica leafy vegetables, bulb vegetables, citrus, cucurbits, corn, fruiting vegetables, legume vegetables, oilseeds, soybean, strawberry and root and tuber vegetables (except sugar beet).	-
Cyazofamid (Ranman) UPL	21	Protectant & curative		P		Registered in Brassica leafy vegetable seedlings for the control of Downy Mildew. US registration for control of <i>Pythium</i> spp. in carrot, leafy greens, succulent-podded and succulent-shelled beans, tuberous and corm vegetables, tomato greenhouse transplants and greenhouse-grown bell peppers.	-
Fludioxonil + Sedaxane (Vibrance Premium) Syngenta	12 +7	Protective Seed Treatment		P		Registered for control of Black Scurf (<i>Rhizoctonia</i>), Silver Surf, Black Rot, Gangrene and Fusarium Dry Rot and suppression of Scab in potatoes. Hort Innovation is pursuing studies to control Rhizoctonia in beetroot.	R3
Fosetyl-Aluminium (Aliette)	33	Curative		P		Registered for control of <i>Phytophthora</i> spp. in apples, peaches, avocados & pineapples.	-
NUL3163 Nufarm	TBC			P		New active in development from Nufarm with activity on <i>Fusarium</i> , <i>Pythium</i> & <i>Rhizoctonia</i> .	-
<i>Streptomyces lydicus</i> WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological	NR	P		Registered in strawberries and tomato for control of Phytophthora and as a seed treatment in vegetables for control of Pythium, Fusarium and Rhizoctonia .	-
Thiophanate-Methyl + Etridiazole (Banrot)	1+14	Protectant		P		Registered in container grown ornamentals and in ground bedding plants as a post plant soil drench for control of <i>Pythium</i> , <i>Phytophthora</i> , <i>Rhizoctonia</i> and <i>Thielaviopsis</i> .	-
Thiram + Thiabendazole (Evershield) UPL	1+M3	Protectant		P		Registered in field & garden peas for control of Black Spot (<i>Mycosphaerella pinodes</i>) & Seedling Root Rots (<i>Fusarium</i> , <i>Pythium</i> & <i>Macrophomina</i> spp.).	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Boil Smut (<i>Ustilago maydis</i>)							
Priority: Moderate							
Boil Smut was ranked as a moderate priority in QLD, VIC & NSW and as a low priority in WA & TAS. This is a sporadic disease, but it can occasionally be severe. Infections result in boils or galls forming on above-ground plant parts. Infection is increased if corn is physically damaged, as well as by high soil nitrogen. Spores are carried on the wind and in irrigation water, while resting spores on crop residues are known to potentially survive in the soil for more than 15 years.							
Carboxin + Thiram (Vitavax)	7+M3	Protectant & Curative	NR	A	ALL	Registered in sweet corn as a seed treatment for the control of Boil Smut , Seedborne Head Smut and Seed Decay / Seedling Blight Complex (<i>Rhizoctonia</i> , <i>Fusarium</i> & <i>Pythium</i> spp.) Coverage of all seeds is essential. Treated seeds should not be held for the next season.	R2
Flutriafol	3	Protectant & Curative		P		US registration for control of Southern Corn Leaf Blight, Northern Corn Leaf Blight, Common Rust, Head Smut and Common Smut.	-
Fusarium Cob Rot (<i>Fusarium</i> spp.)							
Priority: Moderate							
Fusarium Cob Rot was ranked as a moderate priority in VIC, QLD & NSW and as a low priority in WA & TAS. Cob Rots develop through infection of the silks by spores, or by the symptomless growth of the fungus through the plant. Insect damage may allow the fungus to enter the cob. Favoured by warm, wet weather 2-3 weeks after silking. The key management practice is planting resistant varieties.							
<i>Bacillus amyloliquefaciens</i> (Serenade Opti) Bayer	BM 02	Biological	NR	P		Registered for control of Botrytis in grapes and strawberries, control of Anthracnose and suppression of Stem End Rot in avocado and mango and suppression of Bacterial Spot in capsicum chilli and tomatoes. US registration for control of Fusarium spp. in various crops.	-
<i>Bacillus amyloliquefaciens</i> (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of Botrytis in grapes and strawberries. US registration for control of Fusarium spp. in various crops.	-
NUL3163 Nufarm	TBC			P		New active in development from Nufarm with activity on Fusarium , <i>Pythium</i> & <i>Rhizoctonia</i> .	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Head Smut (<i>Sporisorium reilianum</i>)							
Priority: Moderate							
Head Smut was ranked as a moderate priority in VIC, QLD & NSW and as a low priority in TAS & WA. Infection is initiated by soil-borne spores that germinate and directly penetrate emerging seedlings and young plants. Symptoms are not expressed until flowering and cob formation. Spores can survive at least 5–7 years in cool, dry soils with infection most likely under warm, dry conditions. Avoid planting fields with known infestations in cool, dry weather and ensure planting seed is disease-free.							
Carboxin + Thiram (Vitavax)	7+M3	Protectant & Curative	NR	A	ALL	Registered in sweet corn as a seed treatment for the control of Boil Smut, Seedborne Head Smut and Seed Decay / Seedling Blight Complex (<i>Rhizoctonia</i> , <i>Fusarium</i> & <i>Pythium</i> spp.) Coverage of all seeds is essential. Treated seeds should not be held for the next season.	R2
Flutriafol	3	Protectant & Curative		P		US registration for control of Southern Corn Leaf Blight, Northern Corn Leaf Blight, Common Rust, Head Smut and Common Smut.	-
Johnson Grass Mosaic Virus (<i>JGMV</i>)							
Priority: Moderate							
Johnson Grass Mosaic Virus was ranked as a moderate priority in VIC & QLD and as a low priority in WA, NSW & TAS. Johnson Grass Mosaic Virus is transmissible mechanically and by aphids non-persistently. The main hosts of the virus are Johnson Grass (<i>Sorghum halepense</i>) and a Wild Sorghum (<i>Sorghum verticilliflorum</i>) which develop mosaic and ringspot symptoms and act as perennial reservoirs of the virus. Early infection causes stunting and serious yield losses. Plant resistant varieties, particularly for late season plantings. Controlling aphids is not effective at reducing disease transmission.							
Southern Leaf Blight (<i>Bipolaris maydis</i>)							
Priority: Moderate							
Southern Leaf Blight was ranked as a moderate priority in VIC & NSW and as a low priority in QLD, WA & TAS. Survives on crop residues in the soil. The use of good farm hygiene and crop rotation are key management practices.							
Propiconazole (Tilt) Syngenta	3	Protective & curative	28 G:28	P-A	ALL	Permitted to use on sweet corn for control of Northern Corn leaf blight (PER13116). Registered for control of various fungal diseases in apricots, banana, peanuts, pineapple & stone fruits. Registered in the USA for control of Northern and Southern corn leaf blight .	R3
Flutriafol	3	Protectant & Curative		P		US registration for control of Southern Corn Leaf Blight , Northern Corn Leaf Blight, Common Rust, Head Smut and Common Smut.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Wallaby Ear (leafhopper-induced phytotoxemia)							
Priority: Moderate							
A virus causing Wallaby Ear disease was ranked as a moderate priority in VIC & QLD and as a low priority in WA, NSW & TAS. The virus is predominantly transmitted by leafhoppers <i>Cicadulina bimaculate</i> and <i>Nesoclutha pallida</i> . Use resistant varieties and avoid planting summer crops in coastal areas.							
Bacterial Leaf Streak (<i>Xanthomonas campestris</i>)							
Priority: Low							
Bacterial Leaf Streak was consistently ranked as a low priority in VIC, QLD, WA, NSW & TAS. Good farm hygiene and crop rotation should be used to reduce disease incidence. Fungicide treatments have not proven to be effective.							
Acibenzolar-S-methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered for the suppression of Bacterial Speck, Bacterial Spot (<i>Xanthomonas spp.</i>), Bacterial Canker and Powdery Mildew in tomatoes. US registration for suppression of <i>Xanthomonas spp.</i> in Brassica leafy vegetables, cucurbits, low growing berry, bulb onion, pepper and tomato.	-
<i>Bacillus amyloliquefaciens</i> (Serenade Opti) Bayer	BM 02	Biological	NR	P		Registered for control Botrytis in strawberries and grapes, suppression of Bacterial Spot in tomato, chili and capsicum and control of Anthracnose and suppression of Stem End Rot in tropical fruits. US registration for control of <i>Botrytis</i> , <i>Sclerotinia</i> , <i>Xanthomonas</i> and <i>Erwinia</i> in grapes, strawberries, pome fruits, tree nuts, leafy vegetables & potatoes.	-
<i>Bacillus amyloliquefaciens</i> strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of Botrytis in grapevines and strawberries. US registration for control of <i>Xanthomonas spp.</i> in brassica leafy vegetables, citrus, fruiting vegetables, leafy vegetables, stone fruit, strawberries, root and tuber vegetables and tree nuts.	-
Copper	M1	Protectant		P		Registered for control of <i>Xanthomonas spp.</i> in mangoes, stone fruit, French beans, capsicums, brassicas, lettuce and tomatoes.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Charcoal Rot (<i>Macrophomina phaseolina</i>) Priority: Low							
Charcoal Rot was rated as a low priority in VIC, QLD, WA, NSW & TAS.							
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in vegetables for application to soil to improve bioavailability of soil resources to horticultural crops.	-

4.2 Insect and mite pests of sweet corn

4.2.1 Insect and mite pest priorities

Common name	Scientific name
High	
Cotton Bollworm / Corn Earworm	<i>Helicoverpa armigera</i>
Fall Armyworm	<i>Spodoptera frugiperda</i>
Armyworm	<i>Mythimna convecta</i> , <i>Spodoptera exempta</i> , <i>Persectania ewingii</i>
Corn Aphid	<i>Rhopalosiphum maidis</i>
Green Peach Aphid	<i>Myzus persicae</i>
Moderate	
Green Vegetable Bug	<i>Nezara viridula</i>
Two-Spotted Mite	<i>Tetranychus urticae</i>
African Black Beetle	<i>Heteronychus arator</i>
Maize Thrips	<i>Frankliniella williamsi</i>
Western Flower Thrips	<i>Frankliniella occidentalis</i>
False Wireworm	<i>Gonocephalum</i> spp.
True Wireworm	Elateridae
Cutworms	<i>Agrotis</i> spp.

Common name	Scientific name
Low	
Sorghum Head Caterpillar	<i>Cryptoblabes adoceta</i>
Planthopper	Delphacidae
Maize Leafhopper (Wallaby Ear)	<i>Cicadulina bimaculata</i>
Rutherglen Bug	<i>Nysius vinitor</i>
Yellow Peach Moth	<i>Conogethes punctiferalis</i>
Black Field Cricket	<i>Teleogryllus commodus</i>
Mole Cricket	<i>Gryllotalpa</i> spp.
Grasshopper	Orthoptera
Dried Fruit Beetle	<i>Carpophilus</i> spp.
Red Shouldered Leaf Beetle	<i>Monolepta australis</i>
Plague Soldier Beetle	<i>Chauliognathus lugubris</i>
Black Field Earwig	<i>Nala lividipes</i>

New incursions of an exotic pest which pose a potential threat.

New Pest to Australia (unknown priority)	
Vegetable Leafminer	<i>Liriomyza sativae</i>
Serpentine Leafminer	<i>Liriomyza huidobrensis</i>
American Serpentine Leafminer	<i>Liriomyza trifolii</i>

Armyworm, Helicoverpa and Aphids were ranked as high priority, with Corn Aphid the major Aphid of concern and Green Peach Aphid also mentioned although it was noted that different Aphids can be difficult to distinguish in the field.

The main pests of sweet corn can be categorised as follows.

In the rootzone and young plants: Wireworms, False Wireworms, Cutworms, Black Beetles, Armyworms.

In silks and cobs: *Helicoverpa armigera* (Heliothis/Corn Earworm) is the primary sweet corn pest. Corn Aphid can transmit Maize Dwarf Mosaic Virus. This virus is not normally seen in crops in New South Wales. Rarely do aphids cause direct feeding damage, however they are a problem for fresh export of sweet corn, as colonies are often found in the cob sheath.

Fall Armyworm is a recent exotic pest incursion that has also become a major pest of sweet corn. Larvae will hide in the leaf whorl making them difficult to control with insecticide applications. Insecticides are most effective when targeted at young plants using products with residual activity that will control larvae that come out at night to feed on treated leaves. An Integrated Pest Management approach is essential for managing Fall Armyworm in sweet corn.

Many of the predators and parasitoids that are natural enemies of *Helicoverpa* also attack Fall Armyworm.

Available and potential products for control of insects and mites are listed in Section 4.2.2.

Resistance Management

There are several insecticide management strategies that apply to vegetables on the CropLife website⁶, including Lepidoptera, Mites, Thrips and Aphids.

⁶ www.croplife.org.au/resources/programs/resistance-management/

4.2.2 Available and potential products for priority insects and mites

TABLE KEY: Note that blank fields in the table indicate no information has been provided.

Availability		Regulatory risk (refer to Appendix 6)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG
IPM – indicative overall impact on beneficials (based on the Cotton Pest Management Guide 2018-19 and cotton use patterns)			
VL – Very low; L – Low; M – Moderate; H – High; VH – Very High; - not specified			

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Cotton Bollworm / Corn Earworm (<i>Helicoverpa armigera</i>)								
Priority: High								
Corn Earworm was ranked as a high priority in all states. There are many control options available, but resistance is an issue to be mindful of as repeated exposure and poor rotation can lead to resistance build up. Corn Earworm is more prevalent in warm weather and populations usually peak during late summer. Larvae feed on all plant parts but most economic damage is caused by direct feeding on the developing cob.								
Alpha-Cypermethrin	3A	Contact & Ingestion	7	A	ALL	Registered in sweet corn for the control of Helicoverpa . Apply if larvae are < 5 mm long. [Max no. of applications not specified; re-treatment interval 5-8 d]	VH Bee:H	-
<i>Bacillus thuringiensis subsp. kurstaki</i> (DiPel)	11C	Biological	NR	A	ALL	Registered in vegetables for control of Caterpillars, including Helicoverpa . [Apply a minimum of 2 sprays, 3 d apart; re-treatment interval 3-5 d]	VL Bee:L	-
Chlorantraniliprole (Coragen) FMC	28	Ingestion	7 G:7	A	ALL	Registered in sweet corn for control of Helicoverpa . Spray during egg laying/hatching. [Max of 3 sprays per crop; max 2 consecutive; Re-treatment interval 7 d]	L Bee:VL	-
Cypermethrin	3A	Contact	7	A	ALL	Registered in sweet corn for the control of Helicoverpa . Apply if larvae are < 5 mm long. [Max no. of applications not specified; re-treatment interval 5-8 d]	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Deltamethrin	3A	Contact	5	A	ALL	Registered in sweet corn for the control of Helicoverpa . Apply if larvae are < 5 mm long. [Max no. of applications not specified; re-treatment interval 3-5 d]	VH Bee:H	-
Diazinon	1B	Contact	14	A	ALL	Registered in sweet corn for control of Caterpillars and Cutworms. [Max no. of applications and re-treatment interval not specified]	H Bee:H	R3
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 G:21	A	ALL	Registered in sweet corn for control of Helicoverpa . Apply when larvae are small. [Max 4 application per year; re-treatment interval not specified]	M Bee:H	-
Esfenvalerate (Sumi-Alpha Flex)	3A	Contact	7	A	ALL	Registered in sweet corn for the control of Helicoverpa . [Max no. of applications not specified; re-treatment interval 2-7 d]	VH Bee:H	-
Ethyl Formate	-	Fumigant	-	A	ALL	Registered as a post-harvest treatment in sweet corn for control of Helicoverpa , Corn Aphid, Two-Spotted Spider Mite, Western Flower Thrip, Plague Thrip and Green Peach Aphid.	-	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars , Earwigs, Whitefly, Thrips and Leafhoppers. [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Helicoverpa NPV (Vivus Max) AgBiTech	31	Biological	NR	A	ALL	Registered in sweet corn for control of Helicoverpa . Apply prior to silk emergence. [Max no. of applications not specified; re-treatment interval 2-3 d]	VL Bee:L	-
Indoxacarb (Avatar eVo) FMC	22A	Ingestion	3 G:3	A	ALL	Registered in sweet corn for suppression of Corn Earworm . [Max 3 applications per crop; min. re-treatment interval 7 d]	L Bee:H	R3
Magnet Insect Attractant Technology AgBiTech + Methomyl	1A	Contact	10 G:10	A	ALL	Registered in sweet corn for the control of Helicoverpa mixed with methomyl. [Max no. of applications not specified; min. re-treatment interval 5 d]	H Bee:H	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Magnet Insect Attractant Technology AgBiTech + Thiodicarb	1A	Contact	14 G:28	A	ALL	Registered in sweet corn for the control of Helicoverpa mixed with thiodicarb. [Max no. of applications not specified; min. re-treatment interval 5 d]	H Bee:M	R2
Magnet Insect Attractant Technology AgBiTech + Spinosad	5	Ingestion	7 NG	A	ALL	Registered in sweet corn for the control of Helicoverpa mixed with spinosad. [Max no. of applications not specified; min. re-treatment interval 5 d]	L Bee:L	-
Methomyl (Lannate)	1A	Contact	1 G:3	A	ALL	Registered in sweet corn for control of Helicoverpa . [Max no. of applications not specified; re-treatment interval 2-3 d]	H Bee:H	R2
Methoxyfenozide (Prodigy) Corteva PER84531	18	Ingestion	1	A	ALL	Permitted for use in sweet corn for the control of Lepidopteran pests including Helicoverpa spp. [Max 3 applications per crop; re-treatment interval 7 d]	VL Bee:VL	-
Permethrin (Ambush)	3A	Contact	2	A	ALL	Registered in sweet corn for the control of Helicoverpa . [Max no. of applications not specified; re-treatment interval 3-7 d]	VH Bee:H	R3
Spinetoram (Success Neo) Corteva	5	Ingestion	3	A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips. [Max. 4 applications per season; re-treatment interval 7-14 d]	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	NR	A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips. [Max. 4 applications per season; re-treatment interval 7-14 d].	L Bee:L	-
Thiodicarb (Larvin)	1A	Contact	7 G:21	A	ALL	Registered in sweet corn for control of Helicoverpa . Time application to coincide with egg hatching. [Max no. of applications and re-treatment interval not specified]	H Bee:M	-
Zeta-Cypermethrin	3A	Contact	7	A	ALL	Registered in sweet corn for control of Helicoverpa . [Max no. of applications not specified; re-treatment interval 5-8 d]	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms, and a foliar treatment for the control of chewing pests in various crops.	-	-
<i>Clitoria ternatea</i> Extract (Sero-X) Growth Agriculture	-	Biological	NR	P		Registered in cotton for control of <i>Helicoverpa</i> spp., Green Mirids and Silverleaf Whitefly and in brassica leafy vegetables for control of Diamondback Moth. Label extension has been submitted seeking to add new uses for control of Silverleaf Whitefly and Thrips in brassicas and cucurbits.	L Bee:VL	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids, Mites and Caterpillars . Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-

Fall Armyworm (*Spodoptera frugiperda*)

Priority: High

Fall Armyworm is a recent exotic pest incursion that has also become a major pest of sweet corn. Larvae will hide in the leaf whorl making them difficult to control with insecticide applications. Insecticides are most effective when targeted at young plants using products with residual activity that will control larvae that come out at night to feed on treated leaves. An Integrated Pest Management approach is essential for managing Fall Armyworm in sweet corn. Many of the predators and parasitoids that are natural enemies of *Helicoverpa* also attack Fall Armyworm.

Alpha-Cypermethrin PER89279	3A	Contact	7	A	ALL	Permitted in sweet corn for control of Fall Armyworm . [Max. 2 applications per crop; re-treatment interval 7 d]	VH Bee:H	-
Amorphous Silica (Abrade) PER90841	-	Contact	NR	A	ALL (excl. VIC)	Permitted in sweet corn for control of Fall Armyworm . [Max. no. of applications not specified; re-treatment interval 7 d]	L Bee:L	-
Chlorantraniliprole (Coragen) FMC PER89259	28	Ingestion	1	A	ALL (excl. VIC)	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max. 3 applications per crop; 2 consecutive; re-treatment interval 7 d]	L Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Emamectin (Proclaim Opti) Syngenta PER89263	6	Ingestion	3	A	ALL (excl. VIC)	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max 4 applications per crop; re-treatment interval: 7 d]	M Bee:H	-
Indoxacarb (Avatar eVo) FMC PER90374	22A	Ingestion	3 G:3	A	ALL (excl. VIC)	Permitted in sweet corn for control of Fall Armyworm . [Max 3 applications per crop; re-treatment interval: 7 d]	L Bee:H	R3
Indoxacarb (Avatar) FMC PER89705	22A	Ingestion	3 G:3	A	ALL (excl. VIC)	Permitted in sweet corn for control of Fall Armyworm . [Max 3 applications per crop; re-treatment interval: 7 d]	L Bee:H	R3
Indoxacarb (Steward) FMC PER89279	22A	Ingestion	3 G:3	A	ALL (excl. VIC)	Permitted in sweet corn for control of Fall Armyworm . [Max 3 applications per crop; re-treatment interval: 7 d]	L Bee:H	R3
Magnet Insect Attractant Technology AgBiTech PER89398	1A	Contact	8 G:10	A	ALL	Permitted in various crops including sweet corn for control of Fall Armyworm mixed with methomyl. [Max. no. of applications not specified; re-treatment interval 5 d]	H Bee:H	R2
			14 G:28			Permitted in various crops including sweet corn for control of Fall Armyworm mixed with thiodicarb. [Max. no. of applications not specified; re-treatment interval 5 d]	H Bee:M	-
Methomyl (Lannate) PER89293	1A	Contact	1 G:3	A	ALL	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max. 2 applications per crop; re-treatment interval 7 d]	H Bee:H	R2
Methomyl (Lannate) PER89279	1A	Contact	1 G:3	A	ALL	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max. 2 applications per crop; re-treatment interval 7 d]	H Bee:H	R2
Spinetoram (Success Neo) Corteva PER89241	5	Ingestion	3	A	ALL (excl. VIC)	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max. 4 applications per crop; re-treatment interval 7-14 d]	M Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinosad (Entrust Organic) Corteva PER89870	5	Contact & ingestion	3 G:14	A	ALL (excl. VIC)	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max. 4 applications per season; re-treatment interval 7-14 d]	L Bee:L	-
<i>Spodoptera frugiperda</i> Multiple Nucleopolyhedrovirus (Fawligen) AgBiTech PER90820	31	Biological	NR	A	ALL	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max 10 applications per crop; Min. re-treatment interval: 3 d]	VL Bee:L	-
Zeta-Cypermethrin PER89279	3A	Contact	7	A	ALL	Permitted in various crops including sweet corn for control of Fall Armyworm . [Max. 2 applications per crop; re-treatment interval 7 d]	VH Bee:H	-
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Registration submitted concurrently in Australia, Canada, USA, and Mexico as a soil application and seed treatment against chewing insects such as ants, cockroaches and Spodoptera spp. BASF are seeking registrations in amenity turf initially, then potential horticultural crops thereafter.	H Bee:VH	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids, Mites and Caterpillars . Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Armyworm (<i>Mythimna convecta</i> , <i>Spodoptera exempta</i> , <i>Persectania ewingii</i>)								
Priority: High								
Armyworm was ranked as a high priority in QLD & NSW and as a moderate priority in VIC, WA & TAS. They are mainly a problem in seedlings and young plants but can also cause damage to larger plants by feeding on leaves and cobs. It is important to monitor crops for eggs and larvae by regular field scouting. Target sprays against mature eggs and larvae before pests become entrenched. Predators and parasitoids should also be monitored as they are effective at controlling armyworm populations.								
<i>Bacillus thuringiensis subsp. kurstaki</i> (DiPel)	11C	Biological	NR	A	ALL	Registered in vegetables for control of Caterpillars, including Armyworm . [Apply a minimum of 2 sprays, 3 d apart; re-treatment interval 3-5 d]	VL Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Diazinon	1B	Contact	14 G:14	A	ALL	Registered in sweet corn for control of Caterpillars and Cutworms. [Max no. of applications and re-treatment interval not specified]	H Bee:H	R3
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars , Earwigs, Whitefly, Thrips and Leafhoppers. [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Methomyl (Lannate)	1A	Contact	1 G:3	A	ALL	Registered in sweet corn for control of Armyworm . Apply when pests first appear. Spray at dusk for maximum effect. [Max no. of applications not specified; re-treatment interval 2-3 d]	H Bee:H	R2
Zeta-Cypermethrin	3A	Contact	7	A	ALL	Registered in sweet corn for control of Corn Earworm, Native Budworm, and Common Armyworm . [Max no. of applications not specified; re-treatment interval 5-8 d]	VH Bee:H	-
Amorphous Silica (Abrade) Grow Choice PER90841	-	Contact	NR	P-A	ALL (excl. VIC)	Permitted for control of Fall Armyworm in sweet corn. Registered for control of <i>Spodoptera</i> in fruiting vegetables	L Bee:L	-
Chlorantranilprole (Coragen) FMC	28	Ingestion	7 G:7	P-A	ALL	Registered in sweet corn for control of Helicoverpa. Registered for control of <i>Spodoptera spp.</i> in brassica vegetables, brassica leafy vegetables and strawberries.	L Bee:VL	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 G:21	P-A	ALL	Registered in sweet corn for control of Helicoverpa. Registered for control of <i>Spodoptera spp.</i> in brassica vegetables, brassica leafy vegetables, leafy vegetables, fruiting vegetables, legume vegetables, lettuce, root and tuber vegetables and strawberries.	M Bee:H	-
Indoxacarb (Avatar eVo) FMC	22A	Ingestion	3 G:3	P-A	ALL	Registered in sweet corn for suppression of Corn Earworm. Registered for control of <i>Spodoptera spp.</i> in brassica vegetables and solanaceous fruit.	L Bee:H	R3
Spinetoram (Success Neo) Corteva	5	Ingestion	3	P-A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips.	M Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinosad (Entrust Organic) Corteva	5	Ingestion	NR	P-A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips.	L Bee:L	-
Broflanilide (Vedira) BASF	30	Contact & ingestion		P		Registration submitted concurrently in Australia, Canada, USA, and Mexico as a soil application and seed treatment against chewing insects such as Ants, Cockroaches and Spodoptera spp. BASF are seeking registrations in amenity turf initially, then potential horticultural crops thereafter.	H Bee:VH	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids, Mites and Caterpillars . Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
<p>Corn Aphid (<i>Rhopalosiphum maidis</i>) Green Peach Aphid (<i>Myzus persicae</i>) Priority: High</p> <p>Corn Aphid was ranked as a high priority in VIC, QLD & WA, and as a moderate priority in NSW & TAS. Green Peach Aphid was also mentioned although it was noted that different aphids can be difficult to distinguish in the field. Aphids can act as vectors to transmit various diseases.</p>								
Afidopyropen (Versys) BASF	9D	Ingestion	1 G:7	A	ALL	Registered in sweet corn for control of Green Peach Aphid , Cabbage Aphid, Currant Lettuce Aphid, Cotton/Melon Aphid, Corn Aphid & suppression of Silverleaf Whitefly. [Max. 4 applications per crop; re-treatment interval 14 d] Outcome of Hort Innovation project ST17000	L Bee:L	-
<i>Beauveria bassiana</i> (Velifer) BASF	UNF	Biological	NR	A	ALL	Registered in protected vegetables and ornamentals for suppression of Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid and Two-Spotted Spider Mites. [Max. 3 application per crop; re-treatment interval 3-14 d]	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Clothianidin + Imidacloprid (Poncho Plus) BASF	4A	Contact & Ingestion	NR G:28	A	ALL	Registered in sweet corn as a seed treatment for control of Aphids , Cutworms and Wireworms. Provides early season damage up to 3-4 weeks. [Max. 1 application per crop]	M Bee:M	R2
Ethyl Formate	-	Fumigant	-	A	ALL	Registered as a post-harvest treatment in sweet corn for control of Helicoverpa, Corn Aphid , Two-Spotted Spider Mite, Western Flower Thrip, Plague Thrip and Green Peach Aphid .	-	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids , Caterpillars, Earwigs, Whitefly, Thrips and Leafhoppers. [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Paraffinic Oil	-	Contact	NR	A	NSW, ACT, SA, TAS & WA	Registered in sweet corn for control of Aphids , Mites, Whitefly and Bugs. Avoid spraying open blooms. [Max 4 applications per season; re-treatment interval 14 d]	VL Bee:L	-
Pirimicarb (Aphidex)	1A	Contact	10 G:10	A	ALL	Registered in sweet corn for control of Corn Aphid (<i>Rhopalosiphum</i> spp.) Apply before aphid population reaches high levels. [Max 1 application per crop]	VL Bee:VL	R3
Potassium Salts of Fatty Acids (Natrasoap)	-	Contact	NR	A	ALL	Registered in vegetables for control of Spider Mites, Two-Spotted Mites, Aphids , Thrips and Whitefly. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-
Pymetrozine (Chess) Syngenta	9B	Ingestion	14	A	ALL	Registered in sweet corn for control of Corn Aphid (<i>Rhopalosiphum</i> spp.) Apply before aphid population reaches high levels. [Max 2 applications per season; re-treatment interval 14 d]	L Bee:VL	R3
Spirotetramat (Movento) Bayer	23	Ingestion	7 G:7	A	ALL	Registered in sweet corn for control of Corn Aphid . Do not apply prior to tassel emergence. [Max 2 applications per crop; re-treatment interval 7 d]	M Bee:VL	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in sweet corn for control of Green Peach Aphid . Apply before aphid population reaches high levels. [Max 2 applications per season; re-treatment interval 14 d]	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Dimpropridaz (Axalion) BASF	TBC			P		BASF has applied for registration in leafy vegetables, brassica vegetables and fruiting vegetables, including cucurbits to control Whitefly, Aphids and Thrips. Pending regulatory approvals, first market introduction in Australia is expected early 2023.	-	-
Flonicamid (Mainman) UPL	9C	Ingestion		P		Registered for control of Green Peach Aphid in canola, cucurbits and potato.	M Bee:L	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamia for control of Macadamia Lace Bug, Banana Spotting Bug, Fruit Spotting Bug and suppression of Scirtothrips. Pending label extension for control of Silverleaf Whitefly, Green Peach Aphid and Cotton Aphid in green beans, sweet potatoes and potatoes. US registration for control of Green Peach Aphid in brassica leafy vegetables, cucurbits, fruiting vegetables, leafy vegetables, tuberous and corm vegetables and turnip greens.	L Bee:VL	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids , Mites and Caterpillars. Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Green Vegetable Bug (<i>Nezara viridula</i>)								
Priority: Moderate								
Green Vegetable Bug was ranked as a moderate priority in QLD and as a low priority in VIC, WA, NSW & TAS. Adults and nymphs suck sap from young shoots and directly from developing kernels. Feeding sites can become diseased. An occasional pest, most common during spring and summer.								
Paraffinic Oil	-	Contact	NR	A	NSW, ACT, SA, TAS & WA	Registered in sweet corn for control of Aphids, Mites, Whitefly and Bugs (immature). Avoid spraying open blooms. [Max 4 applications per season; re-treatment interval 14 d]	VL Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Trichlorfon (Lepidex)	1B	Contact	2	A	ALL	Registered in vegetables for control of Green Vegetable Bug and Rutherglen Bug. Use when pests are first seen. Spray on nearby weeds. [Max no. of applications not specified; re-treatment interval 7-10 d]	H Bee:H	R2
Sulfoxaflor (Transform) Corteva	4C	Systemic	7	P-A	ALL	Registered in sweet corn for control of Green Peach Aphid. Registered for suppression of Rutherglen Bug in cucurbits, fruiting vegetables, leafy vegetables, root and tuber vegetables and brassica vegetables.	M Bee:VH	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamia for control of Macadamia Lace Bug, Banana Spotting Bug, Fruit Spotting Bug and suppression of Scirtothrips. Pending label extension for control of Silverleaf Whitefly, Green Peach Aphid and Cotton Aphid in green beans, sweet potatoes and potatoes. US registration for control of Aphid, Leafhoppers and Whiteflies in sweet corn.	L Bee:VL	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs , Aphids, Mites and Caterpillars. Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
<p>Two-Spotted Mite (<i>Tetranychus urticae</i>) Priority: Moderate</p> <p>Mites were ranked as a moderate priority in all consulted regions in VIC, QLD, WA, NSW & TAS. Mites are spread from other crops and weeds and are generally worse in dry, warm weather. Farm hygiene is important, and the use of predatory mites (<i>Phytoseiulus persimilis</i>) are suitable for crop releases.</p>								
Abamectin	6	Contact & Ingestion	21 G:21	A	ALL	Registered in sweet corn for control of Two-Spotted Mite and Tomato Red Spider Mite. [Max 2 applications per crop; re-treatment interval 28 d]	M Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
<i>Beauveria bassiana</i> (Velifer) BASF	UNF	Biological	NR	A	ALL	Registered in protected vegetables and ornamentals for suppression of Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid and Two-Spotted Spider Mites . [Max. 3 application per crop; re-treatment interval 3-14 d]	L Bee:L	-
Ethyl Formate	-	Fumigant	-	A	ALL	Registered as a post-harvest treatment in sweet corn for control of Helicoverpa, Corn Aphid, Two-Spotted Spider Mite , Western Flower Thrip, Plague Thrip and Green Peach Aphid.	-	-
Etoxazole (Paramite) Sumitomo PER88170	10B	Contact & Ingestion	21 G:21	A	ALL (excl. VIC)	Permitted in sweet corn for control of Two-Spotted Mite . [Max. 1 application per season]	L Bee:VL	-
Paraffinic Oil	-	Contact	NR	A	NSW, ACT, SA, TAS & WA	Registered in sweet corn for control of Aphids, Mites , Whitefly and Bugs (immature). Avoid spraying open blooms. [Max 4 applications per season; re-treatment interval 14 d]	VL Bee:L	-
Potassium Salts of Fatty Acids (Natrasoap)	-	Contact	NR	A	ALL	Registered in vegetables for control of Spider Mites, Two-Spotted Mites , Aphids, Thrips and Whitefly. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-
Propargite (Omite) PER88179	12C	Contact	28	A	ALL	Permitted in sweet corn for control of Two-Spotted Mite . [Max no. of applications and re-treatment interval not specified]	M Bee:L	R3
Sulphur	UN	Contact	NR	A	ALL	Registered in vegetables for control of Mites . Repeat as needed. [Max no. of applications not specified; re-treatment interval 14 d]	L Bee:L	-
Acequinocyl (Kanemite) UPL	20B	Contact & Ingestion		P		Registered for control of Two-Spotted Mite in pome and stone fruit.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Bifenazate (Acramite) UPL	20D	Contact & Ingestion		P		Registered for control of Two-Spotted Mite in almond, peppers, cucurbits, paw paw, strawberry and tomato.	L Bee:H	-
Cyflumetofen (Danisaraba) BASF	25A	Contact		P		BASF submitted application for a new label registration in July 2020 for control of Two Spotted Mite, European Red Mite and Bryobia Mite in pome fruit and almonds, control of Two Spotted Mite, Citrus Red Mite and Oriental Spider Mite in citrus, control of Two Spotted Mite in grapes; control of Two Spotted Mite and European red mite in fruiting vegetables and strawberry, and control of Two Spotted Mite, European Red Mite and Bryobia Mite in ornamentals.	L Bee:L	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids, Mites and Caterpillars. Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Spiromesifen (Oberon) Bayer	23	Ingestion		P		Australian Registration pending for control of Mites . Hort Innovation project ST19020 is generating data for a new label registration including control of Two-Spotted Mite, Tomato Russet Mite, European Red Mite and Rust Mite in fruiting vegetables (other than cucurbits).	M Bee:VL	-
African Black Beetle (<i>Heteronychus arator</i>)								
Priority: Moderate								
African Black Beetle was ranked as a moderate priority in VIC, QLD, WA & NSW and as a low priority in TAS. Larvae feed on plant roots, reducing growth and potentially killing small plants. Adults can cause major damage by chewing the bases of plants and ringbarking seedlings. Appear in spring and early summer, mainly in coastal areas from VIC to South-East QLD and South-Western WA. Favoured by winter rainfall followed by a warm, dry spring and summer.								
Chlorpyrifos PER88018	1B	Contact	NR G:28	A	ALL	Permitted in sweet corn for control of African Black Beetle . [Max 1 application per crop]	M Bee:M	R1

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms and other soil pests, and a foliar treatment for the control of chewing pests in various crops.	-	-
Dimpropridaz (Axalion) BASF	TBC			P		BASF has applied for registration in leafy vegetables, brassica vegetables and fruiting vegetables, including cucurbits to control Whitefly, Aphids and Thrips. Pending regulatory approvals, first market introduction in Australia is expected early 2023.	-	-
Tetraniliprole (Vayego) Bayer	28	Ingestion		P		Registered in multiple crops for various insect pests such as Beetles , Weevils & Lepidoptera. Hort Innovation has several projects underway towards assisting registration in minor crops.	M Bee:VH	-
<p>Maize Thrips (<i>Frankliniella williamsi</i>) Western Flower Thrips (<i>Frankliniella occidentalis</i>) Priority: Moderate</p> <p>Thrips were ranked as a moderate priority in VIC, QLD, WA & TAS and as a low priority in NSW. It can be difficult to distinguish between thrips species in the field. Feeding in the leaf whorl can cause the leaves to become distorted and cupped, with yellow streaks developing. While this does not appear to significantly affect plant growth, feeding on the cob creates an entry point for diseases such as Fusarium. Thrips are most common in warm, dry weather.</p>								
<i>Beauveria bassiana</i> (Velifer) BASF	UNF	Biological	NR	A	ALL	Registered in protected vegetables and ornamentals for suppression of Western Flower Thrips , Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid and Two-Spotted Spider Mites. [Max. 3 application per crop; re-treatment interval 3-14 d]	L Bee:L	-
Ethyl Formate	-	Fumigant	-	A	ALL	Registered as a post-harvest treatment in sweet corn for control of Helicoverpa, Corn Aphid, Two-Spotted Spider Mite, Western Flower Thrip , Plague Thrip and Green Peach Aphid.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and Leafhoppers. [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Potassium Salts of Fatty Acids (Natrasoap)	-	Contact	NR	A	ALL	Registered in vegetables for control of Spider Mites, Two-Spotted Mites, Aphids, Thrips and Whitefly. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-
Spinetoram (Success Neo) Corteva	5	Ingestion	3	A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips . [Max. 4 applications per season; re-treatment interval 7-14 d]	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	NR	A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips . [Max. 4 applications per season; re-treatment interval 7-14 d].	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	7 G:7	P-A	ALL	Registered in sweet corn for control of Corn Aphid. Registered for control of Western Flower Thrips in green beans, celery, rhubarb, eggplant, peppers, tomato, herbs, lettuce and bulb vegetables.	M Bee:VL	-
Dimpropridaz (Axalion) BASF	TBC			P		BASF has applied for registration in leafy vegetables, brassica vegetables and fruiting vegetables, including cucurbits to control Whitefly, Aphids and Thrips . Pending regulatory approvals, first market introduction in Australia is expected by late 2022 or early 2023.	-	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamia for control of Macadamia Lace Bug, Banana Spotting Bug, Fruit Spotting Bug and suppression of Scirtothrips. Pending label extension for control of Silverleaf Whitefly, Green Peach Aphid and Cotton Aphid in green beans, sweet potatoes and potatoes. US registration for control of Aphid, Leafhoppers and Whiteflies in sweet corn.	L Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips , Bugs, Aphids, Mites and Caterpillars. Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
<p>False Wireworm (<i>Gonocephalum</i> spp.) True Wireworm (Elateridae) Priority: Moderate</p> <p>Wireworms were rated as a moderate priority in QLD, WA & NSW and as a low priority in VIC & TAS. Larvae live in the soil where they feed on germinating seeds, young plant roots and stem bases. Most likely to be a problem when corn is planted in a field formerly planted with pasture or mulches. Avoid planting crops immediately after a pasture and use seed treatments if wireworms are present in the soil.</p>								
1,3-dichloropropene + Chloropicrin (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of Wireworms . Leave soil undisturbed at least 7 d after treatment. Aerate for a minimum of 21 days before planting. For use by professional and registered fumigators only.	-	-
Clothianidin + Imidacloprid (Poncho Plus) BASF	4A	Contact & Ingestion	NR G:28	A	ALL	Registered in sweet corn as a seed treatment for control of Aphids, Cutworms and Wireworms . Provides early season damage up to 3-4 weeks. [Max. 1 application per crop]	M Bee:M	R2
Imidacloprid (600FS)	4A	Contact & Ingestion	NR G:28	A	ALL	Registered in sweet corn as a seed treatment for control of Wireworms , Earwigs, Wingless Cockroach, Field Cricket and Black Sunflower Scarab Beetles. Ensure thorough coverage of seeds. [Max. 1 application per crop]	M Bee:M	R2
Terbufos (Counter 150G)	1B	Contact	NR	A	ALL	Registered in sweet corn as a seed treatment for control of Wireworms . Provides early season damage up to 3-4 weeks. [Max. 1 application per crop]	H Bee:H	-
Thiamethoxam (Cruiser) Syngenta	4A	Contact & Ingestion	NR G:42	A	ALL	Registered in sweet corn as a seed treatment for control of Wireworms . Provides early season damage up to 3-4 weeks. [Max. 1 application per crop]	M Bee:VH	R2
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms , and a foliar treatment for the control of chewing pests in various crops.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Cutworms (<i>Agrotis</i> spp.)								
Priority: Moderate								
Cutworm was ranked as a moderate priority in VIC, QLD, NSW & TAS and as a low priority in WA. Larvae cut off seedlings at soil level, usually during the night. Plants may be dragged underground to feed on during the day. Damage is most likely during spring, especially in damp areas newly converted to cropping. Weeds are alternate hosts and should be cultivated out of fields well before planting.								
Clothianidin + Imidacloprid (Poncho Plus) BASF	4A	Contact & Ingestion	NR G:28	A	ALL	Registered in sweet corn as a seed treatment for control of Aphids, Cutworms and Wireworms. Provides early season damage up to 3-4 weeks. [Max. 1 application per crop]	M Bee:M	R2
Diazinon	1B	Contact	14	A	ALL	Registered in sweet corn for control of Caterpillars and Cutworms . [Max no. of applications and re-treatment interval not specified]	H Bee:H	R3
Sorghum Head Caterpillar (<i>Cryptoblabes adoceta</i>)								
Priority: Low								
Sorghum Head Caterpillars were ranked as a moderate priority in WA and as a low priority in VIC, QLD, NSW & TAS. Caterpillars feed on silks and wrapper leaves of cobs. Both larvae and their frass can be a contamination issue. An occasional pest in NSW, Queensland and the NT.								
Diazinon	1B	Contact	14	A	ALL	Registered in sweet corn for control of Caterpillars and Cutworms. [Max no. of applications and re-treatment interval not specified]	H Bee:H	R3
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars , Earwigs, Whitefly, Thrips and Leafhoppers. [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Chlorantraniliprole (Coragen) FMC	28	Ingestion	7 G:7	P-A	ALL	Registered in sweet corn for control of Helicoverpa.	L Bee:VL	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 G:21	P-A	ALL	Registered in sweet corn for control of Helicoverpa.	M Bee:H	-
Indoxacarb (Avatar eVo) FMC	22A	Ingestion	3 G:3	P-A	ALL	Registered in sweet corn for suppression of Corn Earworm.	L Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Methoxyfenozide (Prodigy) Corteva PER84531	18	Ingestion	1	P-A	ALL	Permitted for use in sweet corn for the control of Lepidopteran pests including <i>Helicoverpa</i> spp.	VL Bee:VL	-
Spinetoram (Success Neo) Corteva	5	Ingestion	3	P-A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips. Registered for control of Sorghum Head Caterpillar in tropical and sub-tropical fruits (inedible peel).	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	NR	P-A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips. Registered for control of Sorghum Head Caterpillar in tropical and sub-tropical fruits (inedible peel).	L Bee:L	-
Broflanilide (Vedira) BASF	30	Contact & ingestion		P		Registration submitted concurrently in Australia, Canada, USA, and Mexico as a soil application and seed treatment against chewing insects such as Ants, Cockroaches and caterpillars. BASF are seeking registrations in amenity turf initially, then potential horticultural crops thereafter.	H Bee:VH	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids, Mites and Caterpillars . Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Planthopper (Delphacidae)								
Priority: Low								
Adults and nymphs can gather in large numbers inside the leaf whorl, where they suck plant sap and excrete honeydew. This reduces plant vigour, resulting in leaf yellowing, wilting and withering. Young seedlings may be killed. Growth of sooty mould on honeydew reduces photosynthesis. Planthoppers can transmit viruses, particularly Maize Stripe Virus. Most common in warm, humid weather.								
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	P-A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and Leafhoppers.	VH Bee:H	-
Paraffinic Oil	-	Contact	NR	P-A	NSW, ACT, SA, TAS & WA	Registered in sweet corn for control of Aphids, Mites, Whitefly and Bugs (immature).	VL Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Sulfoxaflor (Transform) Corteva	4C	Systemic	7	P-A	ALL	Registered in sweet corn for control of Green Peach Aphid. US registration for control of Leafhoppers in berries, root and tuber vegetables, pome fruit and small fruit vine climbing (except fuzzy kiwifruit).	M Bee:VH	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamia for control of Macadamia Lace Bug, Banana Spotting Bug, Fruit Spotting Bug and suppression of Scirtothrips. Pending label extension for control of Silverleaf Whitefly, Green Peach Aphid and Cotton Aphid in green beans, sweet potatoes and potatoes. US registration for control of Aphids, Leafhoppers and Whiteflies in sweet corn.	L Bee:VL	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids, Mites and Caterpillars. Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-

Maize Leafhopper (*Cicadulina bimaculata*)

Priority: Low

Maize Leafhopper was rated as a low priority in all states. Leafhoppers inject a toxin into the leaf during feeding causing a syndrome known as Wallaby Ear Disease. Symptoms include severely stunted growth and swelling of the leaf veins. Leaves tend to crinkle and in-roll, developing a shortened, upright habit. Leafhoppers are most common in summer, particularly in coastal areas. Some varieties are more susceptible to damage than others. Plants can recover from Wallaby Ear symptoms if leafhoppers are controlled

Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and Leafhoppers . [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Paraffinic Oil	-	Contact	NR	A	NSW, ACT, SA, TAS & WA	Registered in sweet corn for control of Aphids, Mites, Whitefly and Bugs (immature). Avoid spraying open blooms. [Max 4 applications per season; re-treatment interval 14 d]	VL Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Sulfoxaflor (Transform) Corteva	4C	Systemic	7	P-A	ALL	Registered in sweet corn for control of Green Peach Aphid. US registration for control of Leafhoppers in berries, root and tuber vegetables, pome fruit and small fruit vine climbing (except fuzzy kiwifruit).	M Bee:VH	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamia for control of Macadamia Lace Bug, Banana Spotting Bug, Fruit Spotting Bug and suppression of Scirtothrips. Pending label extension for control of Silverleaf Whitefly, Green Peach Aphid and Cotton Aphid in green beans, sweet potatoes and potatoes. US registration for control of Aphids, Leafhoppers and Whiteflies in sweet corn.	L Bee:VL	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs , Aphids, Mites and Caterpillars. Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Rutherglen Bug (<i>Nysius vinitor</i>)								
Priority: Low								
Rutherglen Bug was ranked as a moderate priority in WA, NSW and TAS and as a low priority in VIC and QLD. Sap sucking can dry out tassels and silks as well as damage leaves and husks. Can contaminate packed cobs. Multiplies during spring and early summer in weed species. Usually moves into corn when other hosts are unavailable								
Paraffinic Oil	-	Contact	NR	A	NSW, ACT, SA, TAS & WA	Registered in sweet corn for control of Aphids, Mites, Whitefly and Bugs (immature). Avoid spraying open blooms. [Max 4 applications per season; re-treatment interval 14 d]	VL Bee:L	-
Trichlorfon (Lepidex)	1B	Contact	2	A	ALL	Registered in vegetables for control of Green Vegetable Bug and Rutherglen Bug . Use when pests are first seen. Spray on nearby weeds. [Max no. of applications not specified; re-treatment interval 7-10 d]	H Bee:H	R2
Sulfoxaflor (Transform) Corteva	4C	Systemic	7	P-A	ALL	Registered in sweet corn for control of Green Peach Aphid. Registered for suppression of Rutherglen Bug in cucurbits, fruiting vegetables, leafy vegetables, root and tuber vegetables and brassica vegetables.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamia for control of Macadamia Lace Bug, Banana Spotting Bug, Fruit Spotting Bug and suppression of Scirtothrips. Pending label extension for control of Silverleaf Whitefly, Green Peach Aphid and Cotton Aphid in green beans, sweet potatoes and potatoes. US registration for control of Aphids, Leafhoppers and Whiteflies in sweet corn.	L Bee:VL	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs , Aphids, Mites and Caterpillars. Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-

Yellow Peach Moth (*Conogethes punctiferalis*)

Priority: Low

Yellow Peach Moth was ranked as a low priority in QLD. Larvae tunnel into stems, leaving webbing and excreta. Difficult to control with insecticides because they become entrenched rapidly. A minor pest most common in summer and autumn in QLD and coastal NSW.

Diazinon	1B	Contact	14	A	ALL	Registered in sweet corn for control of Caterpillars and Cutworms. [Max no. of applications and re-treatment interval not specified]	H Bee:H	R3
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars , Earwigs, Whitefly, Thrips and Leafhoppers. [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Chlorantraniliprole (Coragen) FMC	28	Ingestion	7 G:7	P-A	ALL	Registered in sweet corn for control of Helicoverpa.	L Bee:VL	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 G:21	P-A	ALL	Registered in sweet corn for control of Helicoverpa.	M Bee:H	-
Indoxacarb (Avatar eVo) FMC	22A	Ingestion	3 G:3	P-A	ALL	Registered in sweet corn for suppression of Corn Earworm.	L Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Methoxyfenozide (Prodigy) Corteva PER84531	18	Ingestion	1	P-A	ALL	Permitted for use in sweet corn for the control of Lepidopteran pests including <i>Helicoverpa</i> spp. Registered for control of Yellow Peach Moth in custard apple.	VL Bee:VL	-
Spinetoram (Success Neo) Corteva	5	Ingestion	3	P-A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips. Registered for control of Yellow Peach Moth in tropical and sub-tropical fruits (inedible peel) and macadamia.	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	NR	P-A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips. Registered for control of Yellow Peach Moth in tropical and sub-tropical fruits (inedible peel).	L Bee:L	-
Broflanilide (Vedira) BASF	30	Contact & ingestion		P		Registration submitted concurrently in Australia, Canada, USA, and Mexico as a soil application and seed treatment against chewing insects such as Ants, Cockroaches and caterpillars. BASF are seeking registrations in amenity turf initially, then potential horticultural crops thereafter.	H Bee:VH	-
Isocycloseram (Plinazolin) Syngenta	30	Ingestion		P		First global application is proposed for 2023 for Thrips, Bugs, Aphids, Mites and Caterpillars . Registration submitted May 2021 for isocycloseram to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-

Black Field Cricket (*Teleogryllus commodus*)

Mole Cricket (*Gryllotalpa* spp.)

Priority: Low

Crickets were ranked as a low priority in all consulted regions in VIC, QLD, WA, NSW & TAS. Field Crickets feed on above-ground plant parts and Mole Crickets feed on roots. They can also chew holes in thin plastic drip irrigation tape. Crickets are more active in summer months.

Imidacloprid (600FS)	4A	Contact & Ingestion	NR G:28	A	ALL	Registered in sweet corn as a seed treatment for control of Wireworms, Earwigs, Wingless Cockroach, Field Cricket and Black Sunflower Scarab Beetles. Ensure thorough coverage of seeds. [Max. 1 application per crop]	M Bee:M	R2
Fipronil (Regent)	2B	Contact		P		Registered for control of Mole Crickets in potatoes.	M H-Bees	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Grasshoppers (Orthoptera)								
Priority: Low								
Grasshoppers were ranked as a moderate priority in NSW & TAS and as a low priority in VIC, QLD & WA. They have a voracious appetite and can cause severe damage to foliage if the numbers get high. Damage is limited to feeding on newly established plants and reducing plant populations.								
Fenitrothion	1B	Contact		P		Registered for the control of a range of Grasshoppers & Locusts in pastures and cereal crops.	H Bee:H	-
Dried Fruit Beetle (<i>Carpophilus</i> spp.)								
Red Shouldered Leaf Beetle (<i>Monolepta australis</i>)								
Plague Soldier Beetle (<i>Chauliognathus lugubris</i>)								
Priority: Low								
Beetles were ranked as a low priority in all consulted regions in VIC, QLD, WA, NSW & TAS. Adults eat leaves and larvae feed on plant roots but are not generally a problem in corn. Only occasionally a pest but can cause severe damage if present in large numbers. Swarms appear from spring to autumn, particularly in coastal areas of Northern NSW and Queensland. Plague Soldier Beetle is predatory on aphids, caterpillar eggs and other pests. However large numbers may cause crop damage and contaminate cobs.								
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms and other soil pests, and a foliar treatment for the control of chewing pests in various crops.	-	-
Dimpropridaz (Axalion) BASF	TBC			P		BASF has applied for registration in leafy vegetables, brassica vegetables and fruiting vegetables, including cucurbits to control Whitefly, Aphids and Thrips. Pending regulatory approvals, first market introduction in Australia is expected early 2023.	-	-
Tetranilprole (Vayego) Bayer	28	Ingestion		P		Registered in multiple crops for various insect pests such as Beetles , Weevils & Lepidoptera. Hort Innovation has several projects underway towards assisting registration in minor crops.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Black Field Earwig (<i>Nala lividipes</i>)								
Priority: Low								
Earwig was ranked as a low priority in QLD. Usually feed on decaying stubble but also eat newly sown and germinating seed and young roots. Minor and infrequent pest, mainly in heavy black soils.								
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in sweet corn for control of Ants, Aphids, Caterpillars, Earwigs , Whitefly, Thrips and Leafhoppers. [Max no. of applications and re-treatment interval not specified]	VH Bee:H	-
Imidacloprid (600FS)	4A	Contact & Ingestion	NR G:28	A	ALL	Registered in sweet corn as a seed treatment for control of Wireworms, Earwigs , Wingless Cockroach, Field Cricket and Black Sunflower Scarab Beetles. Ensure thorough coverage of seeds. [Max. 1 application per crop]	M Bee:M	R2
Indoxacarb (Avatar eVo) FMC	22A	Ingestion	3 G:3	P-A	ALL	Registered in sweet corn for suppression of Corn Earworm. Registered for control of Earwigs in stone fruit and strawberries.	L Bee:H	R3
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms and other soil pests, and a foliar treatment for the control of chewing pests in various crops.	-	-
Tetraniliprole (Vayego) Bayer	28	Ingestion		P		Registered in multiple crops for various insect pests such as Beetles, Weevils & Lepidoptera. Hort Innovation has several projects underway towards assisting registration in minor crops. Indonesia registration for control of Liriomyza Leafminers and Fall Armyworm in vegetable crops.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Leafminers (<i>Liriomyza</i> spp.)								
Priority: Unknown								
Leafminer was not ranked as a pest in sweet corn. Dipteran Leafminers (<i>Liriomyza</i> spp.) are exotic pests that have recently been detected and become problematic in Australia. For example, the Serpentine Leafminer was first detected in the Sydney area in October 2020 and has since been found in crops in SE Qld. As a group they are destructive pests and can cause significant economic loss through reduced yields and quality when uncontrolled.								
Spinetoram (Success Neo) Corteva PER91155	5	Ingestion	3 NG	A	ALL (excl. VIC)	Permitted for use in various crops including sweet corn for control of Liriomyza species, including Vegetable Leafminer (<i>Liriomyza sativa</i>), Pea Leafminer / Serpentine Leafminer (<i>Liriomyza huidobrensis</i>) & American Serpentine Leafminer (<i>Liriomyza trifolii</i>). [Max. 4 applications per crop; re-treatment interval 7-14 d]	M Bee:H	-
Abamectin	6	Contact & Ingestion	21 G:21	P-A	ALL	Registered in sweet corn for control of Two-Spotted Mite and Tomato Red Spider Mite. Permitted for suppression of Leafminers including Vegetable Leafminer and Serpentine Leafminer in cucurbits, fruiting vegetables, leafy vegetables (except lettuce), legume vegetables, root and tuber vegetables, bulb onions, cabbage (head), celery, rhubarb and bulb vegetables (except bulb onions).	M Bee:H	-
Chlorantraniliprole (Coragen) FMC	28	Ingestion	7	P-A	ALL	Registered in sweet corn for control of Helicoverpa. Permitted for control of Leafminers (<i>Liriomyza</i> spp.) in spinach and silverbeet.	L Bee:VL	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 G:21	P-A	ALL	Registered in sweet corn for control of Helicoverpa. Permitted for control of Liriomyza species, including Vegetable Leafminer in Brassica vegetables.	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	NR	P-A	ALL	Registered in sweet corn for control of Helicoverpa and Western Flower Thrips. Permitted for control of Liriomyza Leafminers in cucurbits, culinary herbs, fruiting vegetables, leafy vegetables, legume vegetables, root and tuber vegetables, stalk and stem vegetables and ornamentals.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spirotetramat (Movento) Bayer	23	Ingestion	7 G:7	P-A	ALL	Registered in sweet corn for control of Corn Aphid. Permitted for control of <i>Liriomyza</i> Leafminers in snow peas, sugar snap peas, lettuce (head lettuce and leafy lettuce), parsley, eggplant, capsicums, chillies, tomatoes, green beans, celery and rhubarb.	M Bee:VL	-
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Permitted for control of <i>Liriomyza</i> species, including Vegetable Leafminer (<i>Liriomyza sativae</i>), Pea Leafminer / Serpentine Leafminer (<i>Liriomyza huidobrensis</i>) and American Serpentine Leafminer (<i>Liriomyza trifolii</i>) in bulb vegetables, fruiting vegetables (all) and potatoes.	L Bee:L	-
Cyromazine (Diptex 150 WP)	17	Insect Growth Regulator		P		Permitted for control of Leafminers including Vegetable Leafminer and Serpentine Leafminer in broccoli, cucurbits, fruiting vegetables, head lettuce, legume vegetables, root and tuber vegetables, and stalk and stem vegetables.	-	-
Tetraniliprole (Vayego) Bayer	28	Ingestion		P		Registered in Australia in multiple crops for various insect pests such as Beetles, Weevils & Lepidoptera. Hort Innovation has several projects underway towards assisting registration in minor crops. Indonesia registration for control of <i>Liriomyza</i> Leafminers and Fall Armyworm in vegetable crops.	M Bee:VH	-

4.3 Weeds in sweet corn

4.3.1 Weed priorities

Common name	Scientific name
Moderate	
Nutgrass	<i>Cyperus rotundus</i>
Johnson Grass	<i>Sorghum halepense</i>
Fat Hen	<i>Chenopodium album</i>

No high priority weed issues identified based on the feedback received but Nutgrass, Johnson Grass and Fat Hen were rated as a moderate priority. There were no weed issues indicated in the previous SARP report by industry stakeholders.

Normally, weeds are easily controlled in sweet corn crops by a range of options available using herbicides and cultivation. Poorly managed weed populations can harbour pests and diseases that can restrict plant growth and cob quality. Rotation of crops and thorough ground preparation will minimise weed problems. Inter-row cultivation is usually necessary once or twice within 30 days of planting to break soil crust, and later can be combined with fertiliser side dressing and hilling-up. Cultivation needs to be shallow, as sweet corn roots are near the surface and must not be damaged.

Specific resistance management strategies for high resistance risk (A and B) and moderate resistance risk (C, D, F, G, I, J, K, L, M, N, Q and Z) herbicide modes of action are available on the CropLife Australia webpage⁷.

⁷ <https://www.croplife.org.au/resources/programs/resistance-management/herbicide-resistance-management-strategies-2/>

4.3.2 Available and potential products for weed control

TABLE KEY: Note that blank fields in the table indicate no information has been provided.

Availability		Regulatory risk (refer to Appendix 6)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – days from last treatment		Resistance risk	
Harvest	H	**	Moderate resistance risk
Not Required when used as directed	NR	***	High resistance risk

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Nutgrass (<i>Cyperus rotundus</i>)							
Priority: Moderate							
Nutgrass was ranked as a high priority in WA and as a moderate priority in VIC & QLD. Prefers damp, water-logged soils but can survive for years underground during dry times. Herbicide options are limited and unreliable. Improve soil drainage if possible.							
EPTC (Eptam)	E**	Sweet Corn / Pre-Emergent	Registered in sweet corn for control of grass and broadleaf weeds and Nutgrass . Cultivate soil thoroughly and deeply to chop up existing stands of weeds during the fallow. Apply when the nuts begin to sprout in spring. Delay sowing until 7 days after application.	NR	A	NSW, ACT & QLD	-
Glyphosate (Roundup)	M**	General Knockdown / Pre-Crop Spray	Registered for control of grass and broadleaf weeds and Nutgrass , as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Norflurazon (Zoliar) AgNova	F**		Registered for control of Nutgrass in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Johnson Grass (<i>Sorghum halepense</i>)							
Priority: Moderate							
Johnson Grass was ranked as a moderate priority in VIC, QLD, WA & NSW. Johnson Grass Mosaic Virus is transmissible mechanically, and by several aphid species non-persistently. The main hosts are Johnson Grass (<i>Sorghum halepense</i>) and Wild Sorghum (<i>Sorghum verticilliflorum</i>) which develop mosaic and ringspot symptoms and act as perennial reservoirs of the virus.							
Dimethamid-P (Outlook)	K**	Sweet Corn / Pre-Emergent	Registered as a pre-emergence application for sweet corn for the control of grass and broadleaf weeds.	NR G:28	A	ALL	-
EPTC (Eptam)	E**	Sweet Corn / Pre-Emergent	Registered as a pre-emergence application for sweet corn for the control of grass and broadleaf weeds.	NR	A	NSW, ACT & QLD	-
Glyphosate (Roundup)	M**	General Knockdown / Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L***	General Knockdown / Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R3
Propachlor (Ramrod)	K**	Sweet Corn / Pre-Emergent	Registered as a pre-emergence application for sweet corn for the control of grass and broadleaf weeds.	NR	A	ALL	R3
S-Metolachlor (Dual Gold)	K**	Sweet Corn / Pre-Emergent	Registered as a pre-emergence application for sweet corn for the control of grass and broadleaf weeds.	NR	A	ALL	-
Norflurazon (Zoliar) AgNova	F**		Registered for control of grass and broadleaf weeds in asparagus, citrus, grapes, nuts, stone and pome fruits.		P		-
Fat Hen (<i>Chenopodium album</i>)							
Priority: Moderate							
Fat Hen was ranked as a moderate priority in QLD & WA and as a low priority in VIC. Herbicide control can be difficult and targeting weeds at early growth stages is critical.							
2,4-D	I**	Sweet Corn / Post-Emergent	Registered in sweet corn for control of broadleaf weeds including Fat Hen . Can also be used as fallow/stubble spray prior to sowing. [Max no of applications not specified]	NR	A	ALL (excl. WA)	-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Atrazine	C**	Sweet Corn / Pre-Plant, Pre-Emergent and Post-Emergent	Registered in sweet corn for control of grass and broadleaf weeds including Fat Hen . Use as a post-emergent only for irrigated crops in light soils. [Max no of applications not specified]	NR G:28	A	ALL	-
Dimethamid-P (Outlook)	K**	Sweet Corn / Pre-Emergent	Registered in sweet corn for control of grass and broadleaf weeds including Fat Hen . Irrigation or rainfall is required within 7 d of application. [Max no of applications not specified]	NR G:28	A	ALL	-
EPTC (Eptam)	E**	Sweet Corn / Pre-Emergent	Registered in sweet corn for control of grass and broadleaf weeds including Fat Hen . Mechanically incorporate immediately after application. Delay sowing until 7 days after application. [Max no of applications not specified]	NR	A	NSW, ACT & QLD	-
Glyphosate (Roundup)	M**	General Knockdown / Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Linuron	C**	Sweet Corn / Post-Plant, Pre-Emergent and Post-Emergent	Registered in sweet corn for control of grass and broadleaf weeds including Fat Hen . Apply post-emergence applications as a directed spray.	NR	A	ALL	R3
MCPA as Sodium Salt	I**	Sweet Corn / Post-Emergent	Registered in corn for control of broadleaf weeds including Fat Hen .	NR G:7	A	ALL (excl. WA)	-
Paraquat + Diquat (SpraySeed)	L***	General Knockdown / Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R3
Propachlor (Ramrod)	K**	Sweet Corn / Pre-Emergent	Registered in sweet corn for control of grass and broadleaf weeds including Fat Hen . Apply as a surface spray immediately after seeding or transplanting. Irrigation or rainfall is required immediately after application.	NR	A	ALL	R3
Aclonifen (Emerger) Bayer	H**	Pre-Emergence	Bayer is expected to seek registration for pre-emergent control of grass and broadleaf weeds in various vegetable crops. Registered in Europe for use in potatoes, legume vegetables and cereals. Fat Hen is listed as susceptible.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Chloridazon (Pyramin) BASF	C**		Registered for control of grass and broadleaf weeds, including Fat Hen , in fodder beet, red beet, silver beet, baby leaf spinach and baby leaf beet.		P		-
S-Metolachlor (Dual Gold) Syngenta	K**		Registered for control of grass and broadleaf weeds including Fat Hen in Brassica vegetables, culinary herbs, rhubarb, spinach, silverbeet, spring onions, beans, sweet corn, sweet potato and fallow.		P		-
Norflurazon (Zoliar) AgNova	F**		Registered for control of grass and broadleaf weeds including suppression of Fat Hen in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-

5. References

5.1 Information:

AgChem Access Priority Access Forum	https://www.agrifutures.com.au/national-rural-issues/agvet-chemicals/
Australian Pesticide and Veterinary Medicines Authority	www.apvma.gov.au
APVMA Chemical review	https://apvma.gov.au/chemicals-and-products/chemical-review/listing
APVMA MRLs	www.legislation.gov.au/Details/F2021C00634
APVMA Permit search	https://productsearch.apvma.gov.au/permits
APVMA Product search	https://productsearch.apvma.gov.au/products
AUSVEG	https://ausveg.com.au
Codex MRL database	http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/
Cotton Pest Management Guide 2020-21	https://www.cottoninfo.com.au/publications/cotton-pest-management-guide
CropLife Australia (resistance management)	https://www.croplife.org.au/resources/programs/resistance-management/
Growcom – Infopest Database	www.infopest.com.au
Hort Innovation	www.horticulture.com.au

5.2 Abbreviations and Definitions:

APVMA	Australian Pesticides and Veterinary Medicines Authority
IPM	Integrated pest management
LOQ	Limit of quantification
MRL	Maximum residue limit (mg/kg or ppm)
Pesticides	Plant protection products (fungicide, insecticide, herbicide, nematicides, rodenticides, etc.).
Plant pests	Diseases, insects, nematodes, rodents, viruses, weeds, etc.
SARP	Strategic Agrichemical Review Process
TBC	To be confirmed
WHP	Withholding Period

5.3 Acknowledgements:

Thanks go to the many industry people who contributed information and collaborated on the review of this report.

6. Appendices:

Appendix 1. Products available for disease control in sweet corn

Appendix 2. Products available for control of insects and mites in sweet corn

Appendix 3. Products available for weed control in sweet corn

Appendix 4. Current permits for use in sweet corn

Appendix 5. Sweet corn Maximum Residue Limits (MRLs)

Appendix 6. Sweet corn Agrichemical Regulatory Risk Assessment

Appendix 1. Products available for disease control in sweet corn

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
1,3-Dichloropropene + Chloropicrin (Telone C-35)	8B	Vegetables / Soil Fumigant	Plant parasitic Nematodes, Symphylans, wireworms, soil borne diseases & suppression of weeds. <i>For use by professional and registered fumigators only.</i>	ALL	NR	-
Azoxystrobin + Cyproconazole (Amistar Xtra) Syngenta	11+3	Sweet Corn	Turcica Leaf Blight (<i>Setosphaeria turcica</i>) Common Rust (<i>Puccinia sorghi</i>) Polysora Rust (<i>Puccinia polysora</i>) Outcome of Hort Innovation project ST17000	ALL	14 G:14	R3
Azoxystrobin + Tebuconazole (Veritas) Adama PER86245	11+3	Sweet Corn	Maize Rust	ALL (excl. VIC)	7	R3
Carboxin + Thiram (Vitavax)	7+M3	Sweet Corn / Seed Treatment	Boil Smut (<i>Ustilago maydis</i>) Seedborne Head Smut (<i>Sphacelotheca reiliana</i>) Seed Decay / Seedling Blight Complex (<i>Rhizoctonia, Fusarium & Pythium</i> spp.)	ALL	NR	R2
Chlorothalonil (Bravo)	M5	Sweet Corn	Turcicum Leaf Blight (<i>Exserohilum turcicum</i>)	ALL	1	R3
Fludioxonil (Maxim 100FS) Syngenta	12	Sweet Corn / Seed Dressing	Damping Off caused by <i>Fusarium</i> (Fusarium spp.) and <i>Penicillium</i> (Penicillium spp.)	ALL	NR	R3
Fludioxonil + Metalaxyl-M (Maxim XL) Syngenta	12+4	Sweet Corn / Seed Dressing	Damping Off and Root Rot caused by <i>Pythium</i> and <i>Fusarium</i> sp.	ALL	NR	R3
Metalaxyl-M (Apron)	4	Sweet Corn / Seed Dressing	Downy Mildew	QLD, TAS, WA & NT	NR	-
Metham Sodium		Soil Fumigant	Fungal diseases including <i>Rhizoctonia, Pythium, Fusarium, Phytophthora, Verticillium, Sclerotinia</i> and Club Root of crucifers.	ALL	NR	-

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Propiconazole (Tilt) PER13116	3	Sweet Corn / Systemic & Protective	Northern Corn Leaf Blight	ALL (excl. TAS)	28 G:28	R3

Appendix 2. Products available for control of insects and mites in sweet corn

Active Ingredient (Trade Name)	Chemical Group	Situation	Pests / Comments	States	WHP	Regulatory risk
Abamectin	6	Sweet Corn (field)	Two Spotted Mite Tomato Red Spider Mite	ALL	21 G:21	-
Afidopyropen (Versys) BASF	9D	Sweet Corn	Green Peach Aphid, Cabbage Aphid, Currant Lettuce Aphid, Cotton/Melon Aphid, Corn Aphid and suppression of Silverleaf Whitefly Outcome of Hort Innovation project ST17000	ALL	1 G:7	-
Alpha-Cypermethrin	3A	Sweet Corn	Corn Earworm Native Budworm	ALL	7	-
Alpha-Cypermethrin PER89279	3A	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	7	-
Amorphous Silica (Abrade) PER90841	-	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (Excl. VIC)	NR	-
<i>Bacillus thuringiensis subsp. kurstaki</i> (DiPel)	11C	Vegetables	Lepidopteran moths & caterpillars, including Armyworm.	ALL	NR	-
<i>Beauveria bassiana</i> (Velifer) BASF	UNF	Protected Vegetables and Ornamentals	Suppression of Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid & Two-Spotted Spider Mites	ALL	NR	-
Chlorantraniliprole (Coragen) FMC	28	Sweet Corn	Cotton Bollworm (<i>Helicoverpa armigera</i>)	ALL	7 G:7	-
Chlorantraniliprole (Coragen) FMC PER89259	28	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (excl. VIC)	1	-
Chlorpyrifos PER88018	1B	Sweet Corn	African Black Beetle	ALL	NR G:28	R1

Active Ingredient (Trade Name)	Chemical Group	Situation	Pests / Comments	States	WHP	Regulatory risk
Clothianidin + Imidacloprid (Poncho Plus) BASF	4A	Sweet Corn / Seed Treatment	Aphids, Cutworms and Wireworms.	ALL	NR G:28	R2
Cypermethrin	3A	Sweet Corn	Corn Earworm (<i>Helicoverpa armigera</i>)	WA, VIC, NSW, ACT & QLD	7	-
			Native Budworm (<i>Helicoverpa punctigera</i>)	SA		
			Native Budworm (<i>Helicoverpa punctigera</i>) Southern Armyworm (<i>Persectania ewingii</i>)	TAS & WA		
			Common Armyworm (<i>Mythimna convecta</i>)	WA, VIC, NSW & ACT		
Dazomet (Basamid)	8F	Soil Fumigant	Various situations for control of soil fungi, nematodes, soil insects and weeds.	ALL	-	-
Deltamethrin	3A	Sweet Corn	Corn Earworm Native Budworm	ALL	5	-
Diazinon	1B	Sweet Corn	Caterpillars Cutworms	ALL (excl. TAS)	14	R3
Enamectin (Proclaim Opti) Syngenta	6	Sweet Corn	Heliopsis	ALL	3 G:21	-
Enamectin (Proclaim Opti) Syngenta PER89263	6	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (excl. VIC)	3	-
Esfenvalerate (Sumi-Alpha Flex)	3A	Sweet Corn	Native Budworm	VIC, TAS, SA & WA	7	-
			Corn Earworm	ALL		
Ethyl Formate	-	Sweet Corn / Post-Harvest Fumigant for Stored Grain	Cotton Bollworm, Native Budworm, Two-Spotted Mite, Western Flower Thrips, Plague Thrips, Green Peach Aphid, Corn Aphid	ALL	NR	-

Active Ingredient (Trade Name)	Chemical Group	Situation	Pests / Comments	States	WHP	Regulatory risk
Etoxazole (Paramite) Sumitomo PER88170	10B	Sweet Corn	Two-Spotted Mite	ALL (excl. VIC)	21 G:21	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Vegetables	Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips & Leafhoppers. Suitable for organic growers.	ALL	1	-
Helicoverpa NPV (Vivus Max) AgBiTech	31	Sweet Corn	Corn Earworm Native Budworm	ALL	NR	-
Imidacloprid (600FS)	4A	Sweet Corn / Flowable Seed Dressing	Sugarcane Wireworm, Eastern False Wireworm, Striate False Wireworm, Southern False Wireworm, Black Field Earwig, Wingless Cockroach, Field Cricket, Black Sunflower Scarab	ALL	NR G:28	R2
Indoxacarb (Avatar eVo) FMC	22A	Sweet Corn	Suppression of Corn Earworm (<i>Helicoverpa armigera</i>)	ALL	3 G:3	R3
Indoxacarb (Avatar eVo) FMC PER90374	22A	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (excl. VIC)	3 G:3	R3
Indoxacarb (Avatar) FMC PER89705	22A	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (excl. VIC)	3 G:3	R3
Indoxacarb (Steward) FMC PER89279	22A	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	3 G:3	R3

Active Ingredient (Trade Name)	Chemical Group	Situation	Pests / Comments	States	WHP	Regulatory risk
Magnet Insect Attractant Technology AgBiTech	1A	Sweet Corn / Mixed with Methomyl	Helicoverpa in conjunction with several other insecticides	ALL	10 G:10	R2
		Sweet Corn / Mixed with Thiodicarb			14 G:28	-
	5	Sweet Corn / Mixed with Spinosad			7 NG	-
Magnet Insect Attractant Technology AgBiTech PER89398	1A	Sweet Corn / Mixed with Methomyl	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	8 G:10	R2
		Sweet Corn / Mixed with Thiodicarb			14 G:28	-
Metham Sodium	-	Soil Fumigant	Soil borne pests and diseases	ALL (excl. TAS)	-	-
Methomyl (Lannate)	1A	Sweet Corn	Heliothis	ALL	1 G:3	R2
			Armyworm	QLD, NSW, SA, WA & NT		
Methomyl (Lannate) PER89293	1A	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	1 G:3	R2
Methomyl (Lannate) PER89279	1A	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	1 G:3	R2
Methoxyfenozide (Prodigy) Corteva PER84531	18	Sweet Corn	Lepidopteran pests including <i>Helicoverpa</i> spp.	ALL	1	-
Paraffinic Oil	-	Sweet Corn	Aphids, Mites, Whitefly & Bugs (immature)	NSW, ACT, SA, TAS & WA	NR	-
Permethrin (Ambush)	3A	Sweet Corn	<i>Helicoverpa</i> spp.	ALL	2	R3

Active Ingredient (Trade Name)	Chemical Group	Situation	Pests / Comments	States	WHP	Regulatory risk
Pirimicarb (Aphidex)	1A	Sweet Corn	Aphids, including Corn Aphid	ALL	10 G:10	R3
Potassium Salts of Fatty Acids (Natrasoap)	-	Vegetables	Spider Mites, Two-Spotted Mites, Aphids, Thrips and Whitefly	ALL	NR	-
Propargite (Omite) PER88179	12C	Sweet Corn	Two-Spotted Mite	ALL	28	R3
Pymetrozine (Chess) Syngenta	9B	Sweet Corn	Corn Aphid (<i>Rhopalosiphum maidis</i>)	ALL	14	R3
Spinetoram (Success Neo) Corteva	5	Sweet Corn	<i>Helicoverpa</i> spp. & Western Flower Thrips	ALL	3	-
Spinetoram (Success Neo) Corteva PER89241	5	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (Excl. VIC)	1	-
Spinetoram (Success Neo) Corteva PER91155	5	Sweet Corn	<i>Liriomyza</i> species, including Vegetable leaf miner (<i>Liriomyza sativa</i>), Pea leaf miner / Serpentine leaf miner (<i>Liriomyza huidobrensis</i>) & American serpentine leaf miner (<i>Liriomyza trifolii</i>)	ALL (Excl. VIC)	3 NG	-
Spinosad (Entrust Organic) Corteva	5	Sweet Corn	<i>Helicoverpa</i> spp. & Western Flower Thrips	ALL	NR	-
Spinosad (Entrust Organic) Corteva PER89870	5	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (excl. VIC)	3 G:14	-
Spirotetramat (Movento) Bayer	23	Sweet Corn	Corn Aphid	ALL	7 G:7	-

Active Ingredient (Trade Name)	Chemical Group	Situation	Pests / Comments	States	WHP	Regulatory risk
<i>Spodoptera frugiperda</i> Multiple Nucleopolyhedrovirus (Fawligen) AgBiTech PER90820	31	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	NR	-
Sulfoxaflor (Transform) Corteva	4C	Sweet Corn	Green Peach Aphid	ALL	7	-
Sulphur	UN	Vegetables	Mites	ALL	NR	-
Terbufos (Counter 150G)	1B	Sweet Corn	Seed treatment for control of Wireworms.	ALL	NR	-
Thiamethoxam (Cruiser) Syngenta	4A	Sweet Corn	Seed treatment for control of Wireworms.	ALL	NR G:42	R2
Thiodicarb (Larvin)	1A	Sweet Corn	<i>Helicoverpa</i> spp.	ALL	7 G:21	-
Trichlorfon (Lepidex)	1B	Vegetables	Green Vegetable Bug & Rutherglen Bug	ALL	2	R2
Zeta-Cypermethrin	3A	Sweet Corn	Corn Earworm, Native Budworm, Southern Armyworm and Common Armyworm	ALL	7	-
Zeta-Cypermethrin PER89279	3A	Sweet Corn	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	7	-

Appendix 3. Products available for weed control in sweet corn

Active ingredient (Trade Name)	Chemical Group	Situation / Crop	Comment / Use / Weed	WHP (days)	States	Regulatory risk
1,3-dichloropropene + Chloropicrin (Telone C-35)	8B	Various crops including vegetables / Soil Fumigant	Plant parasitic Nematodes, Symphylans, Wireworms, soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) & suppression of weeds.	NR	ALL (Restricted use TAS, VIC & SA)	-
2,4-D	I**	Sweet Corn / Post-Emergent Selective	Broadleaf Weeds	NR	ALL (excl. WA)	-
Atrazine	C**	Sweet Corn / Pre-Plant, Pre-Emergent or Post-Emergent	Grass and Broadleaf Weeds	NR G:28	ALL	-
Cyanazine (Bladex)	C**	Sweet Corn / Post-Emergent	Broadleaf Weeds	NR	TAS	R3
Dimethamid-P (Outlook)	K**	Sweet Corn / Pre-Emergent	Grass and Broadleaf Weeds	NR G:28	ALL	-
EPTC (Eptam)	E**	Sweet Corn / Pre-Emergent	Grass and Broadleaf Weeds	NR	NSW, ACT & QLD	-
Fluroxypyr (Starane)	I**	Sweet Corn / Post-Emergent	Broadleaf Weeds	NR G:7	NSW & QLD	-
Glyphosate (Roundup)	M**	General Knockdown / Pre-Crop Spray	Grass and Broadleaf Weeds as a pre-crop spray	NR	ALL	R3
Linuron	C**	Sweet Corn / Pre-Emergent	Grass and Broadleaf Weeds	NR	ALL	R3
MCPA as Sodium Salt	I**	Sweet Corn / Post-Emergent	Broadleaf Weeds	NR G:7	ALL (excl. WA)	-
Paraquat + Diquat (SpraySeed)	L***	General Knockdown / Pre-Crop Spray	Grass and Broadleaf Weeds as a pre-crop spray.	NR	ALL	R3
Propachlor (Ramrod)	K**	Sweet Corn / Pre-Emergent	Grass and Broadleaf Weeds	NR	ALL	R3
S-Metolachlor (Dual Gold)	K**	Sweet Corn / Pre-Emergent	Grass and Broadleaf Weeds	NR	ALL	-

Chemical Group Resistance Risk: ** Moderate, *** High

Appendix 4. Current permits for use in sweet corn

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER89279	Alpha-Cypermethrin, Methomyl, Zeta-Cypermethrin & Indoxacarb / Maize, Sorghum & Sweet Corn / Fall Armyworm	11-Mar-20	31-Mar-23	Plant Health Australia
PER90841	Amorphous Silica (Abrade) / Sweet Corn / Fall Armyworm	31-Mar-21	31-Mar-24	Hort Innovation
PER86245	Azoxystrobin +Tebuconazole (Veritas) / Sweet Corn / Maize Rust	17-Dec-18	31-Dec-23	Hort Innovation
PER89259	Chlorantraniliprole (Coragen) / Various, including Sweet Corn / Fall Armyworm	06-Mar-20	31-Mar-23	Hort Innovation
PER88018	Chlorpyrifos / Sweet Corn / African Black Beetle	23-Nov-20	30-Nov-22	Hort Innovation
PER89263	Emamectin (Proclaim Opti) / Various, including Sweet Corn / Fall Armyworm	10-Mar-20	31-Mar-23	Hort Innovation
PER88170	Etoxazole (Paramite) / Sweet Corn / Two-Spotted Mite	18-Feb-21	29-Feb-24	Hort Innovation
PER90374	Indoxacarb (Avatar eVo) / Sweet Corn / Fall Armyworm	17-Nov-20	30-Nov-23	Hort Innovation
PER89705 Version 4	Indoxacarb (Avatar/Steward) / Sweet Corn / Fall Armyworm (Permit replaced by PER90374)	24-Jun-20	31-Dec-20	Hort Innovation
PER89398	Magnet Insect Attractant Technology / Various, including Sweet Corn / Fall Armyworm	10-Jun-20	30-Jun-22	AgBiTech
PER89293	Methomyl (Lannate) / Various, including Sweet Corn / Fall Armyworm	10-Apr-20	30-Apr-23	Hort Innovation
PER84531 Version 2	Methoxyfenozide (Prodigy) / Sweet Corn / Lepidopteran pests including <i>Helicoverpa</i> spp.	25-Oct-17	31-Aug-25	Hort Innovation
PER88179	Propargite (Omite) / Sweet Corn / Two-Spotted Mite	4-Dec-19	31-Dec-22	Hort Innovation
PER13116 Version 3	Propiconazole (Tilt) / Sweet Corn / Northern Corn Leaf Blight	8-Feb-12	31-Mar-21	Hort Innovation
PER89241	Spinetoram (Success Neo) / Various, including Sweet Corn / Fall Armyworm	06-Mar-20	31-Mar-23	Hort Innovation
PER91155	Spinetoram / Various, including Sweet Corn / Leafminers (<i>Liriomyza</i> spp.)	9-Jun-21	30-Jun-24	Hort Innovation

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER89870	Spinosad (Entrust Organic) / Various, including Sweet Corn / Fall Armyworm	21-Jul-20	31-Jul-23	Hort Innovation
PER90820	<i>Spodoptera frugiperda</i> Multiple Nucleopolyhedrovirus (Fawligen) / Various, including Sweet Corn / Fall Armyworm	30-Mar-21	31-Mar-24	AgBiTech

Appendix 5. Sweet corn Maximum Residue Limits (MRLs)

CODEX commodity groupings of Fruiting vegetables other than cucurbits:

VO 0050	Fruiting vegetables other than cucurbits
VO 0447	Sweet corn (corn-on-the-cob)
VO 1275	Sweet corn (kernels)

The APVMA commodity group numbers have been changed as follows, but the MRL Tables follow the CODEX grouping.

Crop Group 020 (Cereal grains) – Sub-group 020F (Sweet corns) with the following CODEX codes.

- GC 2090 - includes all commodities in sub-group 020F.
- GC 3081 - includes baby corn (*Zea mays L.*, several cultivars)
- GC 0447 - Sweet corn (Corn-on-the-cob) (kernels plus cob with husk removed)
(*Zea mays L.*, several cultivars, not including popcorn)
- GC 1275 - Sweet corn (whole kernel without cob or husk)
(*Zea mays L.*, several cultivars, not including popcorn)
- VO 0050 – Fruiting Vegetables, other than Cucurbits

Vegetables

Note: Sweet corn refers to varieties of corn which are sold as a fresh vegetable or processed as kernels and frozen cobs for human consumption and does not include maize or other varieties of broadacre corn crops sold as grain or fodder. Currently production of all Sweet corn is for the Australian market and no exports are recorded. Available information indicates that in the absence specific limits in legislation the most countries defer to Codex, followed by EU MRL standards or applies a 0.01ppm default value. Food exported to New Zealand from Australia may be legally sold if it complies with Australian requirements. MRLs and legislation are subject to change; the values presented should not be relied on.

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
2,2-DPA		Vegetables	*0.1	-
2,4-D	VO0447	Sweet corn (corn-on-the-cob)	-	*0.05
Abamectin	VO0447	Sweet corn (corn-on-the-cob)	0.05	-
	GC2090	Sweet corns	-	0.002
Acetamiprid	VO0447	Sweet corn (corn-on-the-cob)	-	*0.01
Acetochlor	VO0447	Sweet corn (corn-on-the-cob)	-	0.04
Afidopyropen	GC2090	Sweet corns	*0.01	-
Atrazine	VO0447	Sweet corn (corn-on-the-cob)	*0.1	-
Azoxystrobin	VO1275	Sweet corn (kernels)	-	-
	VO0447	Sweet corn (corn-on-the-cob)	*0.01	-
Bentazone	VO0447	Sweet corn (corn-on-the-cob)	*0.1	*0.01
Benzovindiflupyr	VO0447	Sweet corn (corn-on-the-cob)	-	*0.01
Bicyclopyrone	GC0447	Sweet corn (kernels plus cob with husk removed)	-	0.03
Bifenthrin	VO0050	Fruiting vegetables other than cucurbits	0.5	-
Boscalid	VO0050	Fruiting vegetables other than cucurbits	1	-
Buprofezin	VO0050	Fruiting vegetables other than cucurbits	T2	-
Carbaryl	VO0447	Sweet corn (corn-on-the-cob)	-	0.1

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Chlorantraniliprole	VO0447	Sweet corn (corn-on-the-cob)	*0.01	*0.01
Chlorpyrifos	VO0447	Sweet corn (corn-on-the-cob)	-	0.01
		Vegetables (some exceptions)	T*0.01	-
Chlorthal-Dimethyl		Vegetables (except lettuce)	5	-
Clothianidin	VO0447	Sweet corn (corn-on-the-cob)	0.02	*0.01
Cyanazine	VO0447	Sweet corn (corn-on-the-cob)	*0.02	-
Cyantraniliprole	VO0050	Fruiting vegetables other than cucurbits	2	-
Cypermethrins (including alpha- and zeta- cypermethrin)	VO0447	Sweet corn (corn-on-the-cob)	0.05	*0.05
DDT		Vegetables	E1	-
Deltamethrin	VO0447	Sweet corn (corn-on-the-cob)	-	*0.02
	VO0050	Fruiting vegetables other than cucurbits	0.1	-
	VO1275	Sweet corn (kernels)	0.1	-
Diafenthiuron	VO0447	Sweet corn (corn-on-the-cob)	0.7	-
Diazinon	VO0447	Sweet corn (corn-on-the-cob)	0.7	0.02
Dicamba	VO1275	Sweet corn (kernels)	-	0.02
Dicofol		Vegetables (some exceptions)	5	-
Difenoconazole	GC0447	Sweet corn (kernels plus cob with husk removed)	-	*0.01
Dimethenamid-P	VO0447	Sweet corn (corn-on-the-cob)	*0.02	*0.01
Diquat		Vegetables (some exceptions)	*0.05	-
Disulfoton	VO0447	Sweet corn (corn-on-the-cob)	-	*0.02
	VO1275	Sweet corn (kernels)	-	*0.02
Dithiocarbamates	VO0447	Sweet corn (corn-on-the-cob)	-	*0.1
	VO0050	Fruiting vegetables other than cucurbits	3	-
Emamectin	VO0447	Sweet corn (corn-on-the-cob)	*0.002	-
EPTC		Vegetables	*0.04	-
Etoxazole	VO0050	Fruiting vegetables other than cucurbits	0.05	-
	VO1275	Sweet corn (kernels)	T*0.01	-
Fenvalerate	VO0447	Sweet corn (corn-on-the-cob)	0.05	-
Flonicamid	VO0050	Fruiting vegetables other than cucurbits	T0.5	-
Fluazaindolizine	VO0050	Fruiting vegetables other than cucurbits	0.2	-
Flubendiamide	VO0447	Sweet corn (corn-on-the-cob)	T*0.05	0.02
Fludioxonil	VO0447	Sweet corn (corn-on-the-cob)	*0.02	*0.01
Fluensulfone	VO0050	Fruiting vegetables other than cucurbits	1	-
Fluopyram	GC0447	Sweet corn (kernels plus cob with husk removed)	-	*0.01
Flupyradifurone	VO0447	Sweet corn (corn-on-the-cob)	-	0.05
Fluroxypyr	VO0447	Sweet corn (corn-on-the-cob)	0.2	-
Flusilazole	VO0447	Sweet corn (corn-on-the-cob)	-	*0.01
Fluxapyroxad	VO0447	Sweet corn (corn-on-the-cob)	-	0.15
Fosetyl	VO0050	Fruiting vegetables other than cucurbits	T0.02	-
Glyphosate	VO0447	Sweet corn (corn-on-the-cob)	-	3
	VO0050	Fruiting vegetables other than cucurbits	*0.1	-
Heptachlor		Vegetables (some exceptions)	E0.05	-
Imidacloprid	VO0447	Sweet corn (corn-on-the-cob)	*0.05	*0.02
Indoxacarb	VO0447	Sweet corn (corn-on-the-cob)	*0.01	0.02

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Inorganic Bromide		Vegetables (except peppers)	20	-
Isoxaflutole	VO0447	Sweet corn (corn-on-the-cob)	-	*0.02
Lindane	VO1275	Sweet corn (kernels)	-	E0.01
		Vegetables	E2	-
Linuron		Vegetables (some exceptions)	*0.05	-
Maldison	VO0050	Fruiting vegetables other than cucurbits	3	-
	VO0447	Sweet corn (corn-on-the-cob)	-	0.02
Mesotrione	VO0447	Sweet corn (corn-on-the-cob)	T*0.01	*0.01
Metalaxyl		Vegetables (some exceptions)	T0.1	-
Metaldehyde		Vegetables	1	-
Methiocarb		Vegetables	0.1	-
Methomyl	VO0447	Sweet corn (corn-on-the-cob)	0.1	-
Methoxyfenozide	VO0447	Sweet corn (corn-on-the-cob)	T0.05	*0.02
Methyl Bromide		Vegetables (some exceptions)	T*0.05	-
Metolachlor	VO1275	Sweet corn (kernels)	0.1	-
Milbemectin	VO0050	Fruiting vegetables other than cucurbits	0.02	-
Novaluron	VO0050	Fruiting vegetables other than cucurbits	0.2	-
Paraquat		Vegetables (some exceptions)	*0.05	-
Pendimethalin	VO0447	Sweet corn (corn-on-the-cob)	*0.05	-
Penthiopyrad	VO0447	Sweet corn (corn-on-the-cob)	-	0.02
	VO0050	Fruiting vegetables other than cucurbits	5	-
Permethrin	VO0447	Sweet corn (corn-on-the-cob)	*0.05	0.1
Piperonyl Butoxide		Vegetables	8	-
Picoxystrobin	GC0447	Sweet corn (kernels plus cob with husk removed)	-	*0.01
Pirimicarb	VO1275	Sweet corn (kernels)	-	0.05
	VO0447	Sweet corn (corn-on-the-cob)	0.1	-
Phosphorous acid	VO0050	Fruiting vegetables other than cucurbits	T100	-
Prometryn		Vegetables	*0.1	-
Propachlor	VO0447	Sweet corn (corn-on-the-cob)	0.05	-
Propamocarb	VO0050	Fruiting vegetables other than cucurbits	T0.3	-
Propargite		Vegetables	3	-
Propazine		Vegetables	*0.1	-
Propiconazole	VO0447	Sweet corn (corn-on-the-cob)	*0.02	0.05
Prothioconazole	VO0447	Sweet corn (corn-on-the-cob)	-	0.02
Pydiflumetofen	VO0447	Sweet corn (corn-on-the-cob)	T*0.01	
Pymetrozine	VO0447	Sweet corn (corn-on-the-cob)	*0.01	-
Pyraclostrobin	VO0050	Fruiting vegetables other than cucurbits	0.3	-
Pyrethrins		Vegetables	1	-
Pyriproxyfen	VO0050	Fruiting vegetables other than cucurbits	1	-
Saflufenacil	GC0447	Sweet corn	-	0.01
Sedaxane	VO0447	Sweet corn (corn-on-the-cob)	-	*0.01
Spinetoram	VO0447	Sweet corn (corn-on-the-cob)	*0.01	-
	GC0447	Sweet corn (kernels plus cob with husk removed)	-	*0.01
Spinosad	VO0447	Sweet corn (corn-on-the-cob)	0.02	*0.01
Spiromesifen	VO0447	Sweet corn (corn-on-the-cob)	-	*0.02
Spirotetramat	VO0447	Sweet corn (corn-on-the-cob)	1	-

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
	GC0447	Sweet corn	-	1.5
Sulfoxaflor	VO0447	Sweet corn (corn-on-the-cob)	*0.01	-
	GC0447	Sweet corn (kernels plus cob with husk removed)	-	*0.01
Tebuconazole	VO0447	Sweet corn (corn-on-the-cob)	T0.7	0.6
Terbufos	VO0447	Sweet corn (corn-on-the-cob)	*0.05	0.01
Terbutylazine	VO0447	Sweet corn (corn-on-the-cob)	*0.01	-
Thiamethoxam	VO0447	Sweet corn (corn-on-the-cob)	*0.02	*0.01
Thiodicarb	VO0447	Sweet corn (corn-on-the-cob)	*0.1	-
Triadimefon	VO0050	Fruiting vegetables other than cucurbits	0.2	-
Triadimenol	VO0050	Fruiting vegetables other than cucurbits	1	-
Trichlorfon	VO0447	Sweet corn (corn-on-the-cob)	0.2	-
Trifluralin		Vegetables (some exceptions)	0.05	-

NOTE: MRLs are constantly under review and subject to change. Check for current MRLs and do not rely on the values stated above.

* Indicates that an MRL is at the Limit of Quantitation (LOQ)

T =Temporary MRL

E = The MRL is based on extraneous residues

Sources: APVMA MRLs: Agricultural and Veterinary Chemicals Code (MRL Standard) Instrument 2019. Compilation 4. Prepared 10 July 2021. CODEX MRLs: CODEX Alimentarius International Food Standards database (July 2021), <http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/>

Appendix 6. Sweet Corn Agrichemical Regulatory Risk Assessment

Sweet Corn Agrichemical Regulatory Risk Assessment

August 2021

Regulatory pressures on agrichemicals are increasing globally, with many being either restricted or withdrawn from use. For older agrichemicals these pressures are often the result of reconsiderations involving new or refined risk assessment methodologies that requiring the generation of new data. A consequence of which can be that many of these agrichemicals are not meeting contemporary risk assessment standards as the necessary data is unavailable, or where data is available, the risk posed is considered unacceptable.

The use of agrichemicals can also be impacted through differences in standards between trading partners. The lack of an appropriate pesticide maximum residue limit (MRL) in an importing country can, for practical purposes, effectively prohibit use in the exporting country so as to ensure compliance, as a MRL breach would adversely affect market access.

The effects of the above are greater regulatory pressure placed on the use of individual agrichemicals or chemical groups. As a consequence, it is possible that the number of approved agrichemical options could be adversely impacted.

To assist strategic planning, with respect to future pest management options, the following tables have been developed to highlight the regulatory threats to agrichemicals currently approved for the management of the pests and diseases in Sweet corn as well as current initiatives aimed at addressing identified pest management deficiencies.

Sweet Corn Agrichemical Regulatory Risk Assessment

R1	Short-term: Critical concern over retaining access
R2	Medium-term: Maintaining access of significant concern
R3	Long-term: Potential issues associated with use - Monitoring required

Problem	Active Constituents	Chemical Group	Comment	Activities
INSECT AND MITE PESTS				
Aphids				
Aphids	Afidopyropen	9D		Afidopyropen now registered for control of Green Peach Aphid, Cabbage Aphid, Currant Lettuce Aphid, Melon Aphid and Corn Aphid in sweet corn. Outcome of Hort Innovation project ST17000.
	Clothianidin (ST)	4A	APVMA: Under review Canada: Proposal to cancel foliar use in orchards strawberries and turf EU: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures ⁱ	
	Imidacloprid (ST)	4A	APVMA: Under review Canada: Under review EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
	Paraffinic oil/Petroleum oil			
	Pirimicarb	1A	Codex: JMPR Periodic re-evaluation 2022/23	
Corn aphid	Ethyl formate (Po)	8A	EU: No authorisation in place	
	Pirimicarb	1A	Codex: JMPR Periodic re-evaluation 2022/23	
	Pymetrozine	9B	Canada: Restricted use to glasshouses only Codex: No registrant support EU: No authorisations in place ⁱⁱ	
	Spirotetramat	23		

Problem	Active Constituents	Chemical Group	Comment	Activities
Cotton aphid	Amorphous silica			
Green peach aphid	Ethyl formate (Po)	8A	EU: No authorisation in place	
	Sulfoxaflor	4C	USA: Pollinator concerns	
Beetles				
African black beetle	Chlorpyrifos (PER88018)	1B	APVMA: Under review. Potential issues w.r.t. environmental loading and worker exposure. Codex: Scheduled for review by JMPR Canada: Cancellation of all uses. EU: No authorisation in place ⁱⁱⁱ USA: EPA decision to allow continued use	
Eastern false wireworm	Imidacloprid (ST)	4A	APVMA: Under review Canada: Under review EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
	Thiamethoxam (ST)	4A	APVMA: Under review Canada: Proposal to deregister outdoor uses EU: Outdoor uses deregistered ^{iv} USA: Re-registration with new risk mitigation measures	
Southern false wireworm Striate false wireworm Sugarcane false wireworm	Imidacloprid (ST)	4A	APVMA: Under review Canada: Under review EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
	Thiamethoxam (ST)	4A	APVMA: Under review Canada: Proposal to deregister outdoor uses EU: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	

Problem	Active Constituents	Chemical Group	Comment	Activities
Wireworm	Clothianidin	4A	APVMA: Under review Canada: Proposal to cancel foliar use in orchards strawberries and turf EU: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
	Imidacloprid (ST)	4A	APVMA: Under review Canada: Under review EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
	Terbufos	1B	Codex: Tox re-evaluation scheduled. EU: Deregistered	
Caterpillars/Lepidoptera				
Armyworms	<i>B. thuringiensis</i>	11A		
	Methomyl	1A	APVMA: nominated for review Canada: Majority of uses cancelled EU: No authorisations	
Cabbage white butterfly	<i>B. thuringiensis</i>	11A		
Caterpillars	<i>B. thuringiensis</i>	11A		
	Diazinon	1B	EU: No authorisations Codex: To be reviewed	
	Methoxyfenozide (PER84531)	18	EU: Proposed restricted authorisation & Candidate for substitution	
Common armyworm	Cypermethrin	3A	EU: Proposed restricted authorisation & Candidate for substitution	
	Zeta-cypermethrin	3A		

Problem	Active Constituents	Chemical Group	Comment	Activities
Cutworms	Clothianidin (ST)	4A	APVMA: Under review Canada: Proposal to cancel foliar use in orchards strawberries and turf EU: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
	Diazinon	1B	EU: No authorisations Codex: To be reviewed	
	Imidacloprid (ST)	4A	APVMA: Under review Canada: Under review EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
Diamondback (Cabbage) moth	<i>B. thuringiensis</i>	11A		
Fall armyworm	Alpha-cypermethrin (PER85447 & PER89279)	3A	EU: Non-renewal of approval, grace period expires December 2022	
	Amorphous silica (PER90841)	UNM		
	Chlorantraniliprole (PER89259)	28		
	Emamectin benzoate (PER89263)	6	EU: Candidate for substitution	
	Indoxacarb (PER90374, PER89705 & PER89279)	22A	EU: Proposed non-renewal	
	Methomyl (PER89293 & PER89279)	1A	APVMA: nominated for review Canada: Majority of uses cancelled EU: No authorisations (expired 31/8/19)	
	Spinetoram (PER89241)	10		
	Spinosad (PER89870)	5		
<i>Spodoptera frugiperda</i> NPV (PER90820)	31			

Problem	Active Constituents	Chemical Group	Comment	Activities
Helicoverpa species Native Budworm (<i>H. punctigera</i>) Corn earworm/Cotton bollworm (<i>H. armigera</i>)	Alpha-cypermethrin	3A	EU: Proposed restricted authorisation & Candidate for substitution	
	Chlorantraniliprole	28		
	Cypermethrin	3A	EU: Proposed restricted authorisation & Candidate for substitution	
	<i>B. thuringiensis</i>	11A		
	Deltamethrin	3A		
	Emamectin as benzoate	6	EU: Candidate for substitution	
	Esfenvalerate	3A		
	Helicoverpa NPV	31		
	Methomyl	1A	APVMA: nominated for review Canada: Majority of uses cancelled EU: No authorisations	
	Methoxyfenozide (PER84531)	18	EU: Proposed restricted authorisation & Candidate for substitution	
	Permethrin 40:60	3A	Codex: Re-evaluation scheduled, Support uncertain EU: No authorisation	
	Spinetoram	5		
	Thiodicarb	1A	EU: No authorisations	
Zeta-cypermethrin	3A	EU: Proposed restricted authorisation & Candidate for substitution		
Lightbrown apple moth	<i>B. thuringiensis</i>	11A		
Looper caterpillars	<i>B. thuringiensis</i>	11A		
	Alpha-cypermethrin	3A	EU: Proposed restricted authorisation & Candidate for substitution	
Painted vine moth	<i>B. thuringiensis</i>	11A		
	Spinetoram	5		
Potato moth (Leafminer)	<i>B. thuringiensis</i>	11A		
Soybean & Tobacco looper	<i>B. thuringiensis</i>	11A		

Problem	Active Constituents	Chemical Group	Comment	Activities
Grasshoppers/Locusts				
Australian plague locust	Cypermethrin	3A	EU: Proposed restricted authorisation & Candidate for substitution	
Black field crickets	Imidacloprid (ST)	4A	APVMA: Under review Canada: Under review EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
Spur-throated locust	Cypermethrin	3A	EU: Proposed restricted authorisation & Candidate for substitution	
Jassids/Plant bugs				
Bugs	Paraffinic oil/Petroleum oil			
Leafhoppers	Paraffinic oil/Petroleum oil			
Mites				
Mites	Paraffinic oil/petroleum oils			ST19020 – Spiromesifen (Oberon 240SC) Group 23 Two-Spotted Mite, Tomato Russet Mite, European Red Mite, Rust mite in fruiting vegetables (other than cucurbits) label registration.
Red tomato spider mite	Abamectin (PER14722)	6		
Two-spotted (Red spider) mite	Abamectin (PER14536)	6		
	Ethyl formate (Po)	8A	EU: No authorisation in place	
	Etoxazole (PER88170)	10B	EU: Only uses on greenhouse ornamentals approved & Candidate for substitution	
	Propargite (PER88179)	12C	APVMA: nominated for review	
Thrips				
Thrips	Paraffinic oil/petroleum oils			
	Ethyl formate (Po)	8A	EU: No authorisation in place	
Western flower thrips	Spinetoram	5		
White fly				
Whiteflies	Paraffinic oil/petroleum oils			
Other				
Black field earwig	Imidacloprid (ST)	4A	APVMA: Under review Canada: Under review	
Wingless cockroaches	Imidacloprid (ST)	4A	EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
Leafminers	Spinetoram (PER91155)	5		

Problem	Active Constituents	Chemical Group	Comment	Activities
DISEASES				
Boil smut & Head smut	Carboxin (ST)	7		
	Thiram (ST)	M3	APVMA: Nominated for review Canada: Proposed cancelling of all foliar uses Codex: To be reviewed 2022/23 EU: No authorisation in place	
Downy mildew	Metalaxyl/Metalaxyl-M (ST)	4	Metalaxyl EU: Candidate for substitution Metalaxyl-M EU: Restricted use approval	
Fusarium Root rot	Fludioxonil + Metalaxyl-M	12 + 4	Fludioxonil EU: Under review & Candidate for substitution Metalaxyl-M EU: Restricted use approval	
Pythium root rot (Damping-off)	Fludioxonil + Metalaxyl-M	12 + 4	Fludioxonil EU: Under review & Candidate for substitution Metalaxyl-M EU: Restricted use approval	
Rust	Azoxystrobin + cyproconazole	11 + 3	Cyproconazole APVMA: Nominated for review EU: Candidate for substitution	Outcome of Hort Innovation project ST17000: Amistar Xtra registered in 2021.
	Azoxystrobin + tebuconazole (PER86245)	11 + 3	Tebuconazole APVMA: Nominated for review EU: Candidate for substitution	
Seed decay & Seedling blight/rot	Carboxin (ST)	7		
	Thiram (ST)	M3	APVMA: Nominated for review Canada: Proposed cancelling of all foliar uses Codex: To be reviewed 2022/23 EU: No authorisation in place	

Problem	Active Constituents	Chemical Group	Comment	Activities
Turcicum leaf blight /Northern corn leaf blight	Azoxystrobin + cyproconazole	11 + 3	Cyproconazole APVMA: Nominated for review EU: Candidate for substitution	Outcome of Hort Innovation project ST17000: Amistar Xtra registered in 2021.
	Chlorothalonil	M5	APVMA: Nominated for review Canada: Review recently completed; continued use considered acceptable EU: Authorisation not renewed ^v .	
	Propiconazole (PER1311A6)	3	APVMA: Nominated for review EU: Non-renewal of approval ^{vi}	
WEEDS				
Broadleaf weeds and grasses	2,4-D	4		
	Atrazine	5	EU: No authorisations in place	
	EPTC	15	EU: No authorisations in place	
	Cyanazine	5	APVMA: Nominated for review EU: No authorisation in place	
	Dimethenamid-P	15		
	Fluroxypyr	4		
	Linuron	5	EU: No authorisations in place	
	MCPA	4		
	Metolachlor/S-metolachlor	15		
	Propachlor	15	EU: No authorisations in place	
	Terbuthylazine	5		

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ⁱ Clothianidin: Berry fruit, fruiting vegetables, ornamentals, pome fruit, turf Reduction in yearly total rate

ⁱⁱ Reg. (EU) 2021/155 MRLs to LOQ from September 2nd, 2021.

ⁱⁱⁱ Chlorpyrifos: Commission Regulation (EU) 2020/1085 set all MRLs at 0.01 mg/kg as of November 13, 2020

^{iv} Use of thiamethoxam limited to permanent greenhouses and that the resulting crop stays its entire life cycle within a permanent greenhouse, so that it is not replanted outside.

^v Chlorothalonil - Withdrawal authorisations by 20 November 2019. Max period of grace: 20 May 2020. Commission Implementing Regulation (EU) 2019/677 <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019R0677&from=EN>

^{vi} Commission Implementing Regulation (EU) 2018/1865