Green Beans

Strategic Agrichemical Review Process (SARP)

April 2021

Hort Innovation
Project – VG18004

Hort Innovation Project Number:
VG18004 – Vegetable Strategic Agrichemical Review Process (SARP) Report Updates

SARP Service Provider:
Vasanthe Vithanage T/A Hortigrow Consulting

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

Date of report:
April 2021

Disclaimer:
Hort Innovation makes no representations and expressly disclaims all warranties (to the extent permitted by law) about the accuracy, completeness, or currency of information in the Bean industry SARP Report. Users of this material should take independent action before relying on its accuracy in any way.

Reliance on any information provided by Hort Innovation is entirely at your own risk. Hort Innovation is not responsible for, and will not be liable for, any loss, damage, claim, expense, cost (including legal costs) or other liability arising in any way (including from Hort Innovation or any other person's negligence or otherwise) from your use or non-use of the Beans SARP Report, or from reliance on information contained in the material or that Hort Innovation provides to you by any other means.

Legal Notice:

Communications Manager
Hort Innovation
Level 7, 141 Walker Street
North Sydney NSW 2060
Australia
Email: communications@horticulture.com.au
Phone: 02 8295 2300

Hort Innovation Strategic levy investment | VEGETABLE FUND

This project has been funded by Hort Innovation using the vegetable research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au

Table of Contents

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 Celery 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 disease:

Common Name	Scientific Name
Sclerotinia Mould	*Sclerotinia sclerotiorum*

1.2 Insects and mites

The high priority insect and mite pests are:

Common Name	Scientific Name
Cotton Bollworm / Corn Earworm	*Helicoverpa armigera*
Native Budworm	*Helicoverpa punctigera*
Bean Pod Borer	*Maruca vitrata*
Broad Mite	*Polyphagotarsonemus latus*
Bean Blossom Thrips	*Megalurothrips usitatis*
Western Flower Thrips	*Frankliniella occidentalis*

1.3 Weeds

There were no high priority weeds identified, but the moderate priority weeds are:

Common Name	Scientific Name
Fat Hen	*Chenopodium album*
Amaranthus	*Amaranthus* spp.
Field Bindweed	*Convolvulus arvensis L.*
Cat's Whiskers	*Cleome* spp.
Wild Radish	*Raphanus raphanistrum*
Pigweed	*Portulaca* spp.
Annual Ryegrass	*Lolium rigidum*
Blackberry Nightshade	*Solanum nigrum*
Common Thornapple	*Datura stramonium*
Volunteer Potato	*Solanum tuberosum*

2. The Australian Green Bean Industry

The Australian Green Bean industry is a major horticultural industry. 'This SARP does not cover Navy Beans and other varieties that are commonly sold dried or tinned.

Green beans are produced in most states of Australia, with the majority of production occurring in Queensland. The major growing regions are Innisfail and Bundaberg along the East Coast.

Production for the year ending in June 2020[1] was 32,759 tonnes with a value of $104m. Ninety-five percent went into the fresh market and fiver percent was exported.

Imported Beans are typically inexpensive, and very little of the total Australian production value is frozen or processed further.

Australia is a net exporter of Beans with 1,633 tonnes exported in the year ending in June 2020. Of these fresh Beans, Ninety-four percent was destined for New Zealand, with a very small portion going to Canada and other countries.

Fresh Beans are available in Australia throughout year due to varying climate conditions and new cultivars.

Fresh Beans seasonality by state:

State	19/20 t	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
New South Wales (8%)	2,493												
Victoria (14%)	4,429												
Queensland (53%)	17,405												
Western Australia (1%)	478												
Tasmania (24%)	7,954												
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 Bean 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 Bean 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 Bean 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 Green Bean 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 Green Beans 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 Plan for the Vegetable Industry[2] which covers Green Beans outlines key threats to the industry, risk mitigation plans, identification and categorisation of exotic pests and contingency plans.

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

3.2 Minor use permits and registrations

From a pesticide access perspective, the APVMA classifies Green Beans as a major crop (*Phaseolus* spp.) The crop fits within the APVMA Crop Group 014: Legume vegetables; Subgroup 014A, Beans with pods (VP 2060).

Therefore, access to minor use permits can be difficult and permit requests need to be in accordance to the APVMA's minor use guidance[3].

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 Bean 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 Green Beans 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	Engagement and consultation with growers and other relevant stakeholders. Including; Online crop specific surveys, workshops and one on one consultation Nationally. Collation of information collected by commodity on applicable pests, diseases and weeds in order of priority.
MT17019 – Regulatory Support & Co-ordination (AKC)	**Green Beans Agrichemical Regulatory Risk Assessment Document** 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 Green Beans as well as current initiatives aimed at addressing identified pest management deficiencies.
VG18004 – Vegetable Strategic Agrichemical Review Process (SARP) Report Updates	**SARP updated via a desktop audit:** 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 green beans
Appendix 2. Products available for control of insects and mites in green beans
Appendix 3. Products available for weed control in green beans
Appendix 4. Current permits for use in green beans
Appendix 5. Green Beans Maximum Residue Limits (MRLs)
Appendix 6. Green Beans Agrichemical Regulatory Risk Assessment

4. Diseases, Pests and Weeds of Green Beans

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 website[4].

In Chapter 4 information on regulatory risk derived from project MT17019 (Regulatory support and coordination) has been incorporated.

Some of the suggested options have no overseas MRLs (see Appendix 5).

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 Green Beans

4.1.1 Disease priorities

Common name	Scientific name
High	
Sclerotinia Mould	*Sclerotinia sclerotiorum*
Moderate	
Root Rot	*Rhizoctonia solani*
Damping Off	*Pythium spp., Phytophthora spp., Fusarium spp., Rhizoctonia spp.*
Fusarium Wilt	*Fusarium* spp.
Halo Blight	*Pseudomonas syringae pv. phaseolicola*
Leaf & Pod Spot	*Ascochyta pisi*
Blight	*Mycosphaerella pinodes*
Botrytis Mould	*Botrytis* spp.
Bacterial Brown Spot	*Pseudomonas syringae pv. Syringae*
Common Bacterial Blight	*Xanthomonas campestris pv. Phaseoli*
Rust	*Uromyces* spp.
Stem Blight	*Macrophomina* spp.
Cowpea Mild Mottle Virus (CPMMV)	Carlavirus CPMMV
Low	
Ascochyta Blight	*Ascochyta* spp.
Anthracnose	*Colletotrichum lindemuthianum*
Downy Mildew	*Peronospora viciae*
Angular Leaf Spot	*Phaeoisariopsis griseola*
Black Spot	*Phoma medicaginis var. pinodella*
Powdery Mildew	*Erysiphe pisi*

The most important disease issue based on the feedback received was Sclerotinia Mould. This issue received a high priority in the previous SARP (2014) along with Damping Off which has received a moderate ranking this year. Available and potential products for all these diseases are in Section 4.1.2.

Some of the fungal and bacterial diseases that have received moderate to low priority have few options to suppress or control but should be supplemented by management practices that would increase airflow and minimise moisture in the plant canopy. Soil fumigation also helps in preventing some diseases such as Damping Off in Green Beans.

Management methods that promote clean seeds and transplant material, early detection and disposal of infected seedlings would keep most of these diseases in check whilst eliminating alternative hosts, crop rotation, cover crops, bio fumigation and farm hygiene are also important to prevent spread of these between sites. Taking precautions to prevent spread of disease from nursery to field would also help in this effort.

Resistance Management

There are several disease resistance management strategies that apply to vegetables on the CropLife website[5], including Powdery Mildew and Downy Mildew.

[5] www.croplife.org.au/resources/programs/resistance-management/

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
Sclerotinia Mould (*Sclerotinia sclerotiorum*) **Priority: High**							
Sclerotinia Mould was ranked as a high priority in VIC, QLD, NSW, WA & TAS. Sclerotinia is a fungal pathogen that attacks a wide range of vegetables and can survive in the soil for many years.							
1,3-Dichloropropene + Chloropicrin (Telone C-35)	8B	Soil fumigant	NR	A	ALL	Registered for control of plant parasitic Nematodes, Symphylans, Wireworms, and **soil borne diseases** in field crops. ***For use by professional and registered fumigators only.***	-
Azoxystrobin (Amistar 250 SC)	11	Protectant & Curative	NR G:14	A	ALL	Registered in beans for suppression of **Sclerotinia Rot**. [Max. 3 applications per crop; 2 consecutive; re-treatment interval 7-14 d]	-
Boscalid (Filan) BASF	7	Protectant & Curative	7 G:7	A		Registered in legume vegetables (field grown) for control of **Sclerotinia Rot**. [Max. no. of applications not specified; re-treatment interval 7-14 d]	-
Cyprodinil + Fludioxonil (Switch) Syngenta	9+12	Protectant & Curative	7 NG	A	ALL	Registered in green beans for control of *Botrytis* spp and **Sclerotinia Rot**. [Max. 3 applications per crop; 2 consecutive; re-treatment interval 7-10 d]	R3
Dazomet (Basamid, Cerlong)	8F	Soil fumigant	NR	A	ALL	Registered as a general fumigant to control Nematodes, insects, weeds and **soil fungi** *Pythium, Phytophthora, Fusarium*, and *Verticillium*. Do not plant for 14- 42 d after soil treatment.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Iprodione (Rovral) PER84955	2	Protectant & Curative	7	A	ALL (excl. VIC)	Permitted for use in green beans for control of **Sclerotinia**. [Max. 4 applications per crop; re-treatment interval 7-10 d]	R2
Mandestrobin (Intuity) Sumitomo	11	Protectant & Curative	7	A	ALL	Registered in green beans for control of **Sclerotinia White Mould**. [Max. 2 applications per crop; re-treatment interval 7-10 d]	-
Bacillus amyloliquefaciens (Serenade Opti) Bayer PER87630	BM 02	Biological	NR	P-A	ALL (excl. VIC)	Permitted in green beans for suppression of Bacterial Spot / Blight. US registration for control of **Sclerotinia White Mould** in legume vegetables.	-
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological		P	ALL (excl. VIC)	Registered for suppression of **Sclerotinia Rot** in fruiting vegetables.	-
Fluazinam (Shirlan) Syngenta	29	Protectant		P		Registered in Brassica vegetables in Australia for club root. Registered in the US for **Sclerotinia** and Alternaria control in carrots.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas. US registration for control Powdery Mildew, Alternaria Leaf Spot, Gummy Stem Blight, Septoria, Botrytis, Cladosporium, Cercospora, **Sclerotinia**, Rust and Anthracnose and suppression of Rhizoctonia in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered in Lettuce (including leafy lettuce) for the control of Sclerotinia sclerotiorum.	-
NUL3446	TBC			P		Fungicide in development from Nufarm with activity on ***Sclerotinia*** spp.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of Botrytis in berries, grapes, and Botrytis and **Sclerotinia** in leafy vegetables and potato.	R3
Root Rot (*Rhizoctonia solani*) **Damping Off** (*Pythium* spp., *Phytophthora* spp., *Fusarium* spp., *Rhizoctonia* spp.) **Priority: Moderate**							
Root Rot was ranked as a moderate priority in VIC, QLD, NSW, WA & TAS. The fungus causes brown, rotten areas or sunken cankers that may be covered by fungal mycelium. Vegetables growing near the ground can be infected, developing firm, water-soaked areas that become sunken and often crack open. Management practices include seed treatments and on-farm sanitation. Damping Off was ranked as a high priority in VIC, and as a moderate priority in QLD, NSW, WA & TAS. The disease attacks seedlings at the 1-2 leaf stage, causing water-soaked lesions on the stem and roots. Severe infections can cause stunting and yellowing in older crops. Management practices include seed treatments and on-farm sanitation.							
1,3-Dichloropropene + Chloropicrin (Telone C-35)	8B	Soil fumigant	NR	A	ALL	Registered for control of plant parasitic Nematodes, Symphylans, Wireworms, and **soil borne diseases** in field crops. ***For use by professional and registered fumigators only.***	-
Dazomet (Basamid, Cerlong)	8F	Soil fumigant	NR	A	ALL	Registered as a general fumigant to control Nematodes, insects, weeds and **soil fungi** *Pythium, Phytophthora, Fusarium*, and *Verticillium*. Do not plant for 14- 42 d after soil treatment.	-
Quintozene (Terraclor)	14	Protectant	28	A	ALL	Registered in beans (all types) for control of Stem and Root Rot (***Rhizoctonia***). [Max. no. of applications and re-treatment interval not specified]	-
Thiram	M3	Protectant	7	A	QLD	Registered in beans (all types) for control of **Damping Off**. [Max. no. of applications not specified; re-treatment interval 5-7 d]	R2
Bacillus amyloliquefaciens (Serenade Opti) Bayer PER87630	BM 02	Biological	NR	P-A	ALL (excl. VIC)	Permitted in green beans for suppression of Bacterial Spot / Blight. US registration for control of Sclerotinia White Mould in legume vegetables.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Amisulbrom (Amishield 500WG) Nufarm	21	Protectant		P		Registered for control of Clubroot and suppression of **Damping Off** in brassica vegetables, and control of Powdery Scab and suppression of Pink Rot in potatoes.	-
Bacillus amyloliquefaciens strain QST 713 (Serenade Prime) Bayer	BM 02	Biological		P		Registered as a soil ameliorant for suppression of ***Rhizoctonia*** in potatoes. Registered in Legume vegetables in Canada and the USA for suppression of Rhizoctonia damping off and root rot.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological		P		Registered for control of *Botrytis* in grapes and strawberries in Australia. US registration for control of *Botrytis* in legume vegetables and for the management of *Pythium* spp., *Phytophthora* spp., *Fusarium* spp*.,* ***Rhizoctonia*** spp. in peppers.	-
Fludioxonil + Metalaxyl-M (Maxim XL) Syngenta	12+4	Protectant & Curative		P		Registered for control of Damping Off in canola, industrial hemp, maize, oilseed mustard, silverbeet, sorghum, spinach and sweet corn.	R3
Fludioxonil + Metalaxyl-M + Azoxystrobin (Dynasty Seed Treatment) Syngenta	12+4 +11	Protectant & Curative		P		Registered for control of **Damping Off** in cotton.	R3
Fludioxonil + Sedaxane (Vibrance Premium Seed Treatment) Syngenta	12+7	Protectant & Curative		P		Registered in potatoes for control of Black Scurf (***Rhizoctonia***), Silver Surf, Black Rot, Gangrene and Fusarium Dry Rot and suppression of Scab. Hort innovation is conducting research for use in beetroot to control ***Rhizoctonia***.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered in Australia for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas. US registration for control of Powdery Mildew, Alternaria Leaf Spot, Gummy Stem Blight, Septoria, Botrytis, Cladosporium, Cercospora, Sclerotinia, Rust and Anthracnose and suppression of **Rhizoctonia** in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R3
NUL3163 Nufarm	TBC			P		New fungicide in development from Nufarm with activity on ***Rhizoctonia* spp.**	-
Streptomyces lydicus WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological		P		Registered in strawberries and tomato for control of Phytophthora and as a seed treatment in vegetables for control of ***Pythium, Fusarium* and *Rhizoctonia***. Apply prior to onset of disease season.	-
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 ***Pythium, Phytophthora, Rhizoctonia*** and *Thielaviopsis*.	-
Thiram + Thiabendazole (P-Pickel T)	1+M3	Protectant		P		Registered as a seed treatment for control of ***Fusarium*** and ***Pythium*** seedling root rots (*Macrophomina* spp.) in faba beans.	R2
Fusarium Wilt (*Fusarium* spp.) **Priority: Moderate**							
Fusarium Wilt was ranked as a moderate priority in VIC, QLD, NSW, WA & TAS. Infected roots are dark brown and flattened, and the leaves of affected plants show yellowing, curling and eventually wither and decay because of the compromised root system. Cultural controls recommended including crop rotation, on-farm sanitation and the use of resistant varieties.							
1,3-Dichloropropene + Chloropicrin (Telone C-35)	8B	Soil fumigant	NR	A	ALL	Registered for control of plant parasitic Nematodes, Symphylans, Wireworms, and **soil borne diseases** in field crops. ***For use by professional and registered fumigators only.***	-
Dazomet (Basamid, Cerlong)	8F	Soil fumigant	NR	A	ALL	Registered as a general fumigant to control Nematodes, insects, weeds and **soil fungi** *Pythium, Phytophthora,* ***Fusarium***, and *Verticillium*. Do not plant for 14- 42 d after soil treatment.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Thiram + Thiabendazole (P-Pickel T)	1+M3	Protectant		P		Registered as a seed treatment for control of ***Fusarium*** and *Pythium* seedling root rots (*Macrophomina* spp.) in Faba beans. Registered for control of Leaf and Pod Spot and Collar Rot (*Phoma medicaginis var. pinodella, Mycosphaerella pinodes* & *Ascochyta pisi*) in peas.	R2
Bacillus amyloliquefaciens strain QST 713 (Serenade Prime) Bayer	BM 02	Biological		P		Registered in Legume vegetables in Canada and the USA for suppression of Fusarium root rot, wilt and crown rot.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological		P		Registered for control of *Botrytis* in grapes and strawberries in Australia. US registration for control of *Botrytis* in legume vegetables and for the management of *Pythium* spp., *Phytophthora* spp., ***Fusarium* spp.**, *Rhizoctonia* spp. in peppers.	-
Streptomyces lydicus WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological		P		Registered in strawberries and tomato for control of Phytophthora and as a seed treatment in vegetables for control of Pythium, **Fusarium** and Rhizoctonia. Apply prior to onset of disease season. [Max. no. of applications and retreatment interval not specified].	-
Halo Blight (*Pseudomonas syringae* pv*. Phaseolicola*) **Priority: Moderate**							
Halo Blight was ranked as a moderate priority in VIC, QLD, NSW & WA and as a low priority in TAS. The bacterium may be introduced in seed or in surviving undecomposed crop residue or other host plants. It can spread in water splash and so overhead irrigation should be avoided.							
Copper	M1	Protectant	1	A	ALL	Registered in beans for control of Rust, Bacterial Blight and **Halo Blight**. [Max. no. of applications not specified; re-treatment interval 10-14 d]	-
Bacillus amyloliquefaciens (Serenade Opti) Bayer PER87630	BM 02	Biological	NR	P-A	ALL (excl. VIC)	Permitted in green beans for suppression of Bacterial Spot / Blight. US registration for control of *Botrytis* and White Mould in legume vegetables and control of ***Pseudomonas syringae*** in berries, cucurbits and stone fruit.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological		P		Registered for control of *Botrytis* and suppression of several other fungal pathogens (*Anthracnose, Phomopsis* and *Rhizopus*) in grapes and berries.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological		P		Registered for control of *Botrytis*, in grapes and strawberries. US registration for control of *Botrytis,* Powdery Mildew and White Mould in legume vegetables.	-
Leaf & Pod Spot (*Ascochyta pisi*) **Priority: Moderate**							
Leaf & Pod Spot was ranked as a moderate priority in VIC, QLD, NSW & WA and as a low priority in TAS. Green Beans may be infected by Ascochyta Blight from two major sources: Sowing infected seed and spores produced on stubble from the previous year. Good on-farm sanitation and clean seed are recommended.							
Mancozeb	M3	Protectant	7 G:7	P-A	ALL	Registered in Green beans for control of Angular Leaf Spot, Anthracnose & Rust. Registered for control of **Ascochyta Blight** in chickpeas.	R2
Azoxystrobin + Tebuconazole (Veritas) Adama	11+3	Protectant & Curative		P		Registered in Pulse crops for the control of **Ascochyta Blight**	R3
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. US registration for control of **Ascochyta Blight** in legume vegetables.	R3
Thiram + Thiabendazole (P-Pickel T)	1+M3	Protectant		P		Registered as a seed treatment for control of *Fusarium* and *Pythium* seedling root rots (*Macrophomina* spp.) in Faba beans. Registered for control of Leaf and Pod Spot and Collar Rot (*Phoma medicaginis var. pinodella, Mycosphaerella pinodes* & ***Ascochyta pisi***) in peas.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Blight (*Mycosphaerella pinodes*) **Priority: Moderate**							
Blight was ranked as a moderate priority in VIC, QLD, NSW & WA and as a low priority in TAS. The fungal pathogen can infect most parts of the plant, with symptoms including leaf, stem, and pod spotting, and foot rot. Good on-farm sanitation and clean seed are recommended.							
Copper	M1	Contact	1	P-A	ALL	Registered in beans for control of Rust, Bacterial Blight and Halo Blight. Registered for control of Bacterial Brown Spot and **Common Blight** and Halo Blight in French beans.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed in Australia. Corteva claims activity on ***Mycosphaerella* spp**. Scheduled for JMPR evaluation in 2023.	-
Isotianil (Routine 200SC) Bayer	P	Protectant		P		Bayer is seeking registration for the control of leaf spot diseases in bananas.	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	21	P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. US registration for control of Mycosphaerella Blight in legume vegetables.	R3
Thiram + Thiabendazole (P-Pickel T)	1+M3	Protectant		P		Registered as a seed treatment for control of *Fusarium* and *Pythium* seedling root rots (*Macrophomina* spp.) in Faba beans. Registered for control of Leaf and Pod Spot and Collar Rot (*Phoma medicaginis var. pinodella,* ***Mycosphaerella pinodes*** & *Ascochyta pisi*) in peas.	R2
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of Botrytis in berries, grapes, and Botrytis and Sclerotinia in leafy vegetables and potato. US registration for control of ***Mycosphaerella* sp** in brassicas.	R3
Botrytis Mould (*Botrytis* spp.) **Priority: Moderate**							
Botrytis was ranked as a moderate priority in VIC, QLD, NSW & WA and as a low priority in TAS. *Botrytis* spp. which causes Grey Mould can affect plants at most stages of production. Affected fruit become water-soaked and soft and are rapidly covered with a thick grey mould. *Botrytis* also causes secondary rots on fruit and vegetables in storage or transit and in the marketplace.							

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Copper	M1	Contact	1	A	ALL	Registered in beans for control of ***Botrytis* spp**., Rust, Bacterial Blight & Halo Blight. [Max. no. of applications not specified; re-treatment interval 10-14 d]	-
Cyprodinil + Fludioxonil (Switch) Syngenta	9+12	Protectant & Curative	7 NG	A	ALL	Registered in green beans for control of ***Botrytis* spp.** and Sclerotinia Rot. [Max. 3 applications per crop; 2 consecutive; re-treatment interval 7-10 d]	R3
Azoxystrobin (Amistar 250 SC)	11	Protectant & Curative	NR G:14	P-A	ALL	Registered in beans for suppression of Sclerotinia Rot. Registered for control of ***Botrytis*** in snow peas and sugar snap peas.	-
Bacillus amyloliquefaciens (Serenade Opti) Bayer PER87630	BM 02	Biological	NR	P-A	ALL (excl. VIC)	Permitted in green beans for suppression of Bacterial Spot / Blight. Registered for control of ***Botrytis*** in tomato, capsicum, chilli and several fruits. US registration for control of ***Botrytis*** in legume vegetables.	-
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological		P		Registered for control of ***Botrytis*** and suppression of several other fungal pathogens (*Anthracnose, Phomopsis* and *Rhizopus*) in grapes and berries.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological		P		Registered for control of ***Botrytis*** in grapes and strawberries. US registration for control of ***Botrytis*** in legume vegetables.	-
BLAD (Problad Plus)	BM 01	Biological		P		Registered for control of Brown Rot and Blossom Blight in stone fruit. US registration for control of ***Botrytis*** in fruiting vegetables, grapes, strawberries and ornamentals.	-
DC-126 Bayer	TBC			P		New product from Bayer with **Botrytis** activity.	-
Eugenol + Geraniol + Thymol (Novellus) Eden Research PLC	1	Protectant & Curative		P		Registered for control of **Botrytis** in grapes.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fenpyrazamine (Prolectus) Sumitomo	17	Protectant & Curative		P		Registered for **Botrytis** control in grapes. US registration for control of **Botrytis** in almonds, berries, lettuce, pistachios and ornamentals.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed in Australia. Corteva claims activity on **Botrytis**. Scheduled for JMPR evaluation in 2023.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas. US registration for control of a variety of diseases including Powdery Mildew, Alternaria Leaf Spot, Gummy Stem Blight, Septoria, ***Botrytis***, *Cladosporium, Cercospora, Sclerotinia* and Anthracnose in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R3
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered for control of various leaf diseases in almonds, cherries and macadamia. US registration for control of ***Botrytis*** in bulb vegetables, leafy vegetables, pome fruit, stone fruit, strawberries and tree nuts.	-
NUL3195 Nufarm	TBC			P		New product from Nufarm with **Botrytis** activity.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of **Botrytis** in berries, grapes, leafy vegetables and potato. US registration for control of **Botrytis** in berries, bulb vegetables, cucurbits, fruiting vegetables, specific leaf petioles, leafy greens, pistachio, potato and tuberous and corm vegetables.	R3
Bacterial Brown Spot (*Pseudomonas syringae pv. Syringae*) **Priority: Moderate**							
Bacterial Brown Spot was ranked as a high priority in VIC, as a moderate priority in QLD, NSW & WA, and as a low priority in TAS. The bacterium may be introduced in seed or in surviving undecomposed crop residue or other host plants. It can spread in water splash and so overhead irrigation should be avoided.							

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Copper	M1	Protectant	1	A	ALL	Registered in beans for control of Common Blight (*Xanthomonas campestris pv. Phaseoli)*, Halo Blight (*Pseudomonas syringae pv. Phaseasiolicola*) and **Bacterial Brown Spot (*Pseudomonas syringae pv. Syringae*)**. [Max. no. of applications not specified; re-treatment interval 10-14 d]	-
Bacillus amyloliquefaciens (Serenade Opti) Bayer PER87630	BM 02	Biological	NR	P-A	ALL (excl. VIC)	Permitted in green beans for suppression of Bacterial Spot / Blight. Registered for control of *Botrytis* and Bacterial Spot in fruiting vegetables. US registration for control of *Botrytis* and White Mould in legume vegetables and control of ***Pseudomonas syringae*** in berries, cucurbits and stone fruit.	-
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological		P		Registered for control of *Botrytis* and suppression of several other fungal pathogens (*Anthracnose, Phomopsis* and *Rhizopus*) in grapes and berries.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological		P		Registered for control of *Botrytis*, in grapes and strawberries. US registration for control of *Botrytis,* Powdery Mildew and White Mould in legume vegetables.	-
Common Bacterial Blight (*Xanthomonas campestris pv. Phaseoli*) **Priority: Moderate**							
Common Bacterial Blight was ranked as a high priority in VIC, as a moderate priority in QLD, NSW & WA, and as a low priority in TAS. The bacterium may be introduced in seed or in surviving undecomposed crop residue or other host plants. Bacteria spread in water splash during wet, windy weather or by overhead irrigation. It can also disperse on insects, or on people or equipment moving through the crop.							
Bacillus amyloliquefaciens (Serenade Opti) Bayer PER87630	BM 02	Biological	NR	A	ALL (excl. VIC)	Permitted in green beans for suppression of Bacterial Spot / Blight. [Max. no. of applications not specified; re-treatment interval 3-7 d]	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Copper	M1	Protectant	1	A	ALL	Registered in beans for control of Common Blight (***Xanthomonas campestris pv. Phaseoli***), Halo Blight (*Pseudomonas syringae pv. Phaseasiolicola*) and Bacterial Brown Spot (*Pseudomonas syringae pv. Syringae*). [Max. no. of applications not specified; re-treatment interval 10-14 d]	-
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered for suppression of Bacterial Spot ***(Xanthomonas campestris)***, Bacterial Speck and Bacterial Canker in tomatoes. US registration for the suppression of **Black Rot** ***(Xanthomonas campestris)*** in Brassica vegetables.	-
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological		P		Registered for control of *Botrytis* and suppression of several other fungal pathogens (*Anthracnose, Phomopsis* and *Rhizopus*) in grapes and berries.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological		P		Registered for control of *Botrytis*, in grapes and strawberries. US registration for control of *Botrytis,* Powdery Mildew and White Mould in legume vegetables.	-
Rust (*Uromyces* spp.) **Priority: Moderate**							
Rust was ranked as a high priority in WA, as a moderate priority in VIC, QLD & NSW and as a low priority in TAS. Rusts are plant diseases caused by pathogenic fungi which are rarely fatal, but can severely limit growth and fruiting ability.							
Bitertanol (Baycor) Bayer	3	Protectant & Curative	3	A	ALL	Registered in beans for control of **Rust.** [Max. 3 applications per crop; re-treatment interval 14 d]	R3
Copper	M1	Protectant	1	A	ALL	Registered in beans for control of **Rust,** Bacterial Blight & Halo Blight. [Max. no. of applications not specified; re-treatment interval 10-14 d]	-
Mancozeb	M3	Protectant	7 G:7	A	ALL	Registered in Green beans for control of Angular Leaf Spot, Anthracnose & **Rust** [Max. no. of applications not specified; re-treatment interval 7-10 d]	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Metiram (Polyram) BASF	M3	Protectant	7	A	ALL	Registered in beans for control of **Rust** and Anthracnose. [Max. no. of applications not specified; re-treatment interval 7-10 d]	R2
Oxycarboxin (Plantvax) UPL	7	Protectant & Curative	7	A	ALL	Registered in green beans for control of **Rust** [Max. 2 applications per crop; re-treatment interval 14 d]	-
Sulphur	UN	Protectant & Curative	NR	A	ALL	Registered in vegetables for control of Powdery Mildew and **Rust**. Do not apply during the heat of the day. [Max. no. of applications not specified; re-treatment interval 14-21 d]	-
Tebuconazole	3	Protectant & Curative	3	A	ALL	Registered in green beans for control of **Rust**. [Max. 3 applications per crop; re-treatment interval 10-14 d]	R3
Zineb	M3	Protectant	7	A	ALL	Registered in green beans for control of **Rust** and Anthracnose. [Max. no. of applications not specified; re-treatment interval 10 d]	R2
Azoxystrobin (Amistar 250 SC)	11	Protectant & Curative	NR G:14	P-A	ALL	Registered in beans for suppression of Sclerotinia Rot. Registered for control of **Rust** in ornamentals and nursery stock and Syngenta has submitted a label extension for control of Brown Rot and **Rust** in almonds.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas. US registration 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 in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R3
Isopyrazam (Seguris Flexi) Syngenta	7	Protectant & Curative		P		Registered for control of Powdery Mildew in apples. Syngenta has submitted a label extension for the control of Brown Rot and **Rust** in almonds.	-
Stem Blight (*Macrophomina* spp.) **Priority: Moderate**							
Stem Blight was ranked as a moderate priority in QLD, NSW & WA and as a low priority in VIC & TAS. The fungus usually attacks stems causing a watery rot at ground level. Infection of the root and stem prevents the flow of water and nutrients, causing plants to wilt. Spread is mainly through movement of soil or plant debris containing sclerotia, and seed. Good on-farm sanitation and clean seed are recommended.							

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Quintozene (Terraclor)	14	Soil treatment	28	A	ALL	Registered in beans for control of **Stem Rot** and Root Rot (*Rhizoctonia*). [Max. no. of applications and re-treatment interval not specified]	-
Thiram + Thiabendazole (P-Pickel T)	1+M3	Seed Treatment		P		Registered as a seed treatment for control of *Fusarium* and *Pythium* seedling root rots (***Macrophomina* spp.)** in Faba beans. Registered for control of Leaf and Pod Spot and Collar Rot (*Phoma medicaginis var. pinodella, Mycosphaerella pinodes* & *Ascochyta pisi*) in peas.	R2
Cowpea Mild Mottle Virus (CPMMV) **Priority: Moderate**							
Cowpea Mild Mottle Virus (CPMMV) was ranked as moderate in QLD. CPMMV is a member of the Carlavirus group of plant viruses, and it is transmitted by Silverleaf Whitefly. In terms of virus vector management strategies, whitefly control with insecticides is unlikely to be effective due to the very short feeding times for transmission. However, several commercially available green bean varieties are tolerant to the virus. For further information refer to the Hort Innovation project final report VG15073 - Characterisation of a Carlavirus of French Bean.							
Ascochyta Leaf Blight (*Ascochyta fabae*) **Priority: Low**							
Leaf Blight was ranked as a moderate priority in VIC and as a low priority in QLD, NSW, WA & TAS. A bean crop may be infected by Ascochyta Blight from two major sources: Sowing infected seed and spores produced on stubble from the previous year. Management practices include on-farm sanitation and use of clean seed.							
Mancozeb	M3	Protectant	7 G:7	A	ALL	Registered in beans for control of Rust and Cercospora Leaf Spot and suppression of Chocolate Spot and **Ascochyta Leaf Blight**. [Max. no. of applications not specified; re-treatment interval 7-10 d]	R2
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. US registration for the control of Ascochyta Blight in legume vegetables.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Thiram + Thiabendazole (P-Pickel T)	1+M3	Seed Treatment		P		Registered as a seed treatment for control of *Fusarium* and *Pythium* seedling root rots (*Macrophomina* spp.) in Faba beans. Registered for control of Leaf and Pod Spot and Collar Rot (*Phoma medicaginis var. pinodella, Mycosphaerella pinodes* & *Ascochyta pisi*) in peas.	R2
Anthracnose (*Colletotrichum lindemuthianum*) **Priority: Low**							
Anthracnose was ranked as a moderate priority in VIC and as a low priority in QLD, NSW, WA & TAS. It requires both pre- and post-harvest treatments. This fungus can be seed-borne and carry over on crop residue in the soil. It is spread in water droplets and is favoured byt warm, humid weather.							
Mancozeb	M3	Protectant	7 G:7	A	ALL	Registered in green beans for control of **Anthracnose**, Angular Leaf Spot & Rust. [Max. no. of applications not specified; re-treatment interval 7-10 d]	R2
Zineb	M3	Protectant	7	A	ALL	Registered in green beans for control of Rust & **Anthracnose**. [Max. no. of applications not specified; re-treatment interval 10 d]	R2
Bacillus amyloliquefaciens (Serenade Opti) Bayer PER87630	BM 02	Biological	NR	P-A	ALL (excl. VIC)	Permitted in green beans for suppression of Bacterial Spot / Blight. Registered for control of **Anthracnose** in avocado and several tropical fruits. US registration for control of Botrytis and White Mould in legume vegetables.	-
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological		P		Registered for control of Botrytis and suppression of several other fungal pathogens (**Anthracnose**, Phomopsis and Rhizopus) in grapes and berries.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed for AU with activity on Powdery Mildew, *Botrytis* spp., *Septoria* spp., **Anthracnose**, *Alternaria* spp., Scab, *Monilinia* spp. and *Mycosphaerella* spp. Due for registration in 2023.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas. US registration 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 in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R3
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. US registration for control of **Anthracnose** in citrus, corn and tuberous and corm vegetables.	-
Downy Mildew (*Peronospora viciae*) **Priority: Low**							
Downy Mildew was ranked as a moderate priority in VIC & TAS and as a low priority in QLD, NSW & WA. A common disease that is characterised by a white downy fungal growth that develops on the underside of the leaf. Warm, moist weather favours the spread of the disease. Management practices include farm hygiene, crop rotation, planting space (to allow air movement) and the use of fungicides when conditions favour disease.							
Mancozeb PER14593	M3	Protectant	7 G:14	A	ALL (excl. VIC)	Permitted in specified legume vegetables for control of **Downy Mildew**, Anthracnose and Alternaria. [Max. no. of applications not specified; re-treatment interval 7-10 d]	R2
Copper	M1	Protectant	1	P-A	ALL	Registered in beans for control of Rust, Bacterial Blight and Halo Blight. Registered for control of **Downy Mildew** in brassica vegetables, cucurbits, bulb vegetables, grapes, ornamentals, red beet and stalk vegetables.	-
Azoxystrobin + Oxathiapiprolin (Orondis Flexi) Syngenta	11+49	Protectant & Curative		P		Registered in onions for control of **Downy Mildew**.	-
Cyazofamid (Ranman) ISK/UPL	21	Protectant & Curative		P		Registered for the control of **Downy Mildew** in Brassica leafy vegetable seedlings.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Dimethomorph + Ametoctradin (Zampro) AgNova	45+40	Protectant		P		Registered for control of **Downy Mildew** in grape vines. Hort Innovation strategic projects ST16006 and ST17000 have generated data to support a label extension for control of **Downy Mildew** in bulb onion, spring onion, leafy vegetables including brassica leafy vegetables, cucurbits, and beetroot.	-
Fluopicolide + Propamocarb (Infinito) Bayer	28+43	Protectant & Curative		P		Registered for control of **Downy Mildew** in bulb vegetables.	-
Fluoxapiprolin (Cambalio 20SC) Bayer	49	Protectant & Curative		P		Bayer is seeking registration for control of **Downy Mildew** in grapes.	-
Mandipropamid (Revus) Syngenta	40	Protectant & Curative		P		Registered for control of **Downy Mildew** in grapes, lettuce, leafy vegetables and oilseed poppies.	-
Metalaxyl-M + Mancozeb (Ridomil Gold MZ) Syngenta	4+M3	Protectant		P		Registered for control of **Downy Mildew** in cucurbits, grapes, lettuce, onions, ornamentals, poppy and rhubarb.	R2
Oxathiapiprolin (Zorvec Enicade) Corteva	49	Protectant & Curative		P		Registered for control of **Downy Mildew** in bulb vegetables, brassicas, cucurbits, leafy vegetables and poppies.	-
Phosphorous Acid	33	Curative		P		Registered for control of **Downy Mildew** in grapes.	-
Angular Leaf Spot (*Phaeoisariopsis griseola*) **Priority: Low**							
Angular Leaf Spot was ranked as a low priority in VIC, QLD, NSW, WA & TAS. Angular Leaf Spot is caused by bacteria that survive in seeds and plant debris. Symptoms first appear as small, water-soaked spots on leaves, but spread rapidly when conditions are moist and warm. Although not fatal, they can severely limit growth & fruiting ability.							
Mancozeb	M3	Protectant	7 G:7	A	ALL	Registered in green beans for control of **Angular Spot**, Rust and Anthracnose. [Max. no. of applications not specified; re-treatment interval 7-10 d]	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Black Spot (*Phoma medicaginis var. pinodella*) **Priority: Low**							
Black Spot was ranked as a low priority in VIC, QLD, NSW, WA & TAS. It is a fungal infection caused by various *Phoma* species. Management practices include farm hygiene, crop rotation, planting space (to allow air movement) and the use of fungicides when conditions favour disease. Avoid over watering and overhead sprinklers.							
Thiram + Thiabendazole (P-Pickel T)	1+M3	Seed Treatment		P		Registered as a seed treatment for control of *Fusarium* and *Pythium* seedling root rots (*Macrophomina* spp.) in Faba beans. Registered for control of Leaf and Pod Spot and Collar Rot (***Phoma medicaginis var. pinodella***, *Mycosphaerella pinodes* & *Ascochyta pisi*) in peas.	R2
Powdery Mildew (*Erysiphe pisi*) **Priority: Low**							
Powdery Mildew was ranked as a low priority in VIC, QLD, NSW, WA & TAS. Causes a characteristic white, powdery growth, reducing photosynthetic efficiency in affected leaves and causing scarring to fruit. Severe outbreaks can cause defoliation, exposing fruit to sunburn and predisposing them to secondary rots.							
Sulphur	UN	Protectant & Curative	NR	A	ALL	Registered in vegetables for control of **Powdery Mildew** and Rust. Do not apply during the heat of the day. [Max. no. of applications not specified; re-treatment interval 14-21 d]	-
ADM1700F Adama	TBC			P		Fungicide in development from Adama with **Powdery Mildew** activity	-
Azoxystrobin + Difenoconazole (Amistar Top) Syngenta	11+3	Protectant & Curative		P		Registered for control of Alternaria, Cercospora and **Powdery Mildew** in carrots; Alternaria and Phytophthora in potatoes; Alternaria, Phytophthora, Sclerotinia and **Powdery Mildew** in tomatoes.	R3
BLAD (Problad Plus)	BM 01	Biological		P		Registered for control of Brown Rot and Blossom Blight in stone fruit. US registration for control of **Powdery Mildew** in cucurbits, fruiting vegetables, grapes, hops, pome fruit, strawberries and ornamentals.	-
Cyflufenamid (Flute) AgNova	U6	Protectant & Curative		P		Registered for control of **Powdery Mildew** in cucurbits, grapes and strawberries.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed in Australia. Corteva claims activity on **Powdery Mildew**. Scheduled for JMPR evaluation in 2023.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas. US registration for control of a variety of diseases including **Powdery Mildew**, Alternaria Leaf Spot, Gummy Stem Blight, Septoria, *Botrytis, Cladosporium, Cercospora, Sclerotinia* and Anthracnose in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of **Powdery Mildew**, Black Spot and Alternaria in apples.	-
Isopyrazam (Seguris Flexi) Syngenta	7	Protectant & Curative		P		Registered for control of **Powdery Mildew** in apples.	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of **Powdery Mildew** in grapes. US registration for control of **Powdery Mildew** in legume vegetables.	R3
Potassium Bicarbonate (EcoCarb)	M2	Curative		P		Registered for control of **Powdery Mildew** in fruiting vegetables, cucurbits, grapes, rose and strawberry.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of Botrytis in berries, grapes, and Botrytis and Sclerotinia in leafy vegetables and potato. US registration for control of **Powdery Mildew** in brassica vegetables cucurbits, fruiting vegetables, grapes, specific leaf petioles, leafy greens, root and tuber vegetables, mustard greens, potato, root vegetables. strawberry and tuberous and corm vegetables.	R3
NUL3195 Nufarm	TBC			P		Fungicide in development from Nufarm with activity on **Powdery Mildew** and Botrytis.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Pyriofenone (Kusabi) ISK	50			P		Registered for control of **Powdery Mildew** in cucurbits and grapes. Registered in the US for control of **Powdery Mildew** in berry fruit on the US label. AU MRL 0.05 mg/kg; No Codex MRL	-
Streptomyces lydicus WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological		P		Registered for the suppression of **Powdery Mildew** in strawberries.	-

4.2 Insect and mite pests of Green Beans

4.2.1 Insect and mite pest priorities

Common name	Scientific name
High	
Cotton Bollworm / Corn Earworm	*Helicoverpa armigera*
Native Budworm	*Helicoverpa punctigera*
Bean Pod Borer	*Maruca vitrata*
Broad Mite	*Polyphagotarsonemus latus*
Bean Blossom Thrips	*Megalurothrips usitatis*
Western Flower Thrips	*Frankliniella occidentalis*
Moderate	
Plague Thrips	*Thrips imaginis*
Onion Thrips	*Thrips tabaci*
Bean Spider Mite	*Tetranychus ludeni*
Two-Spotted Mite	*Tetranychus urticae*
Rutherglen Bug	*Nysius vinitor*
Green Vegetable Bug	*Nezara viridula*
Bean Fly	*Ophiomyia phaseoli*
Silverleaf Whitefly	*Bemisia tabaci* Biotype B
Low	
Green Peach Aphid	*Myzus persicae*
Looper Caterpillar	*Chrysodeixis* spp.
Grass Blue Butterfly	*Zizina labradus*
Green Snails	*Cornu apertus*

Non-ranked pests and new incursions of an exotic pest which poses a potential threat.

New Pests to Australia (unknown priority)	
Fall Armyworm	*Spodoptera frugiperda*
Vegetable Leafminer	*Liriomyza sativae*
Serpentine Leafminer	*Liriomyza huidobrensis*
American Serpentine Leaf Miner	*Liriomyza trifolii*

Resistance to some insect groups has reduced control options despite a range of actives registered. Growers should not exceed the maximum number of applications permitted on the insecticide label.

Resistance Management

There are several insecticide management strategies that apply to various horticultural crops on the CropLife website[6], including Helicoverpa, Silverleaf whitefly, Mites, Thrips & Aphids.

Further development and extension of IPM strategies and best management practices that can be implemented in the management of sucking insects and mites in Green beans may be warranted.

[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 (*Helicoverpa armigera*) **Native Budworm** (*Helicoverpa punctigera*) **Priority: High**								
Helicoverpa was ranked as a high priority in VIC, QLD & NSW, as a moderate priority in WA and as a low priority TAS. The larvae cause yield reduction by feeding on pods and flowers, leaf feeding does not generally require control measures.								
Alpha Pinene, Anisyl Alcohol, Butyl Salicylate, Cineole, D-Limonene & Phenylacetaldehyde (Magnet)	-	Attractant	H:7 NG	A	ALL	Registered as an adult attractant in green beans for the control of **Helicoverpa** in conjunction with methomyl. Apply prior to an influx of moths, at least 2 applications should be made to achieve extended control [Max. number of treatments not specified; re-treatment interval max. 5 days].	-	-
Bacillus thuringiensis subsp. kurstaki (DiPel)	11A	Biological	NR	A	ALL	Registered in vegetables for control of **Caterpillars**. [Apply a minimum of 2 sprays, 3 d apart; re-treatment interval 3-5 d]	VL Bee:L	-
Chlorantraniliprole (Coragen) FMC	28	Ingestion	1	A	ALL	Registered in green beans 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	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorantraniliprole + Thiamethoxam (Durivo) Syngenta PER87051	28+4A	Contact & Ingestion	35 NG	A	QLD (within Wide Bay Burnett region)	Permitted for use as a single post plant chemigation in green beans (field) for control of Diamondback Moth, Cabbage White Butterfly, **Corn Earworm, Native Budworm**, Cabbage Centre Grub, Cabbage Cluster Caterpillar, Cluster Caterpillar, Cabbage Aphid, Green Peach Aphid, Silverleaf Whitefly – all biotypes, Greenhouse Whitefly, Western Flower Thrips, Green Vegetable Bug, Potato Moth, Tomato Thrips, Brown Sowthistle Aphid, Vegetable Leafhopper, Lucerne Leafroller, Leafhoppers (Jassids), Onion Thrips and Psyllids. [Max. 1 application per crop]. PER87051 is held by Bundaberg Fruit & Vegetable Growers Cooperative and applicable only to QLD growers in Wide Bay Burnett region.	M Bee:VH	R2
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 G:21	A	ALL	Registered in legume vegetables including green beans for control of **Helicoverpa** and Loopers. Apply when larvae are small. [Max 4 application per year; re-treatment interval 7 d]	M Bee:H	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, **Caterpillars**, Earwigs, Whitefly, Thrips and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-
Methomyl (Lannate) PER82428	1A	Contact	3	A	ALL	Permitted for use in legume vegetables for control of ***Helicoverpa* spp.**, Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. [Max 6 applications per crop; re-treatment interval not specified]	H Bee:H	R2
Permethrin	3A	Contact	3	A	Variable- refer to label	Registered in green beans for control of **Helicoverpa**. [Max. no. of applications and re-treatment interval not specified]	VH Bee:H	-
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, Thrips, **Caterpillars**, Leafhoppers, and Whitefly. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinetoram (Success Neo) Corteva	5	Ingestion	3	A	ALL	Registered in legume vegetables including beans for control of Caterpillars (**Helicoverpa** spp. & Loopers) and Western Flower Thrips. [Max 3 applications per crop; re-treatment 7-14 d]	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	A	ALL	Registered in legume vegetables including beans & peas for control of Loopers, **Helicoverpa** & Western Flower Thrips. [Max. 3 applications per crop; re-treatment interval 7-14 d]	L Bee:L	-
Clitoria ternatea Extract (Sero-X) Growth Agriculture	-	Biological		P		Registered in cotton for control of ***Helicoverpa* 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	-
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered for control of ***Helicoverpa*** in brassica vegetables, Chinese leafy vegetables, solanaceous fruit and sweet corn.	L Bee:H	R3
Indoxacarb + Novaluron (Plemax) Adama	22A+15	Contact & Ingestion		P		Registered for the control of various Lepidoptera, including ***Helicoverpa* spp.** in brassica vegetables, leafy vegetables and fruiting vegetables.	M Bee:H	R3
Helicoverpa Nuclear Polyhedrosis Virus (Vivus) AgBiTech	31	Biological		P		Registered for control of **Helicoverpa** in several crops including pulses.	VL Bee:L	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on **Lepidoptera**, Bugs, Beetles/Weevils, Fruit Fly and Thrips.	-	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, Bugs and **Caterpillars**.		-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Bean Pod Borer (*Maruca vitrata*) **Priority: High**								
Bean Pod Borer was ranked as a high priority in QLD & NSW, as a moderate priority in VIC & WA and as a low priority in TAS. Bean Pod Borer larvae feed on buds and flowers and bore into the pod to eat developing seeds. Crops may be infested from early budding onwards.								
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, **Caterpillars**, Earwigs, Whitefly, Thrips and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-
Pyrethrins (Pyganic) Sumitomo PER8655	3A	Contact	1 G:1	A	ALL	Permitted for use in beans for control of **Bean Pod Borer**. [Max 3 applications per crop; re-treatment interval 7 d]	VH Bee:H	-
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, Thrips, **Caterpillars**, Leafhoppers, and Whitefly. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 G:21	P-A	ALL	Registered in legume vegetables including Green Beans for control of Helicoverpa and Looper Caterpillars.	M Bee:H	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on **Lepidoptera**, Bugs, Beetles/Weevils, Fruit Fly and Thrips.	-	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, Bugs, Mites and **Caterpillars**.	-	-
Tetraniliprole (Vayego 200 SC) Bayer	28	Ingestion		P		Tetraniliprole differs from most other group 28 insecticides as the spectrum of control expands beyond Lepidoptera control to include Coleoptera and Diptera plus other specific sucking pests.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Broad Mite (*Polyphagotarsonemus latus*) **Priority: High**								
Broad Mite was ranked as a high priority in QLD. Broad Mites damage the outer cells of the leaf as they feed on the plant sap. The leaves become distorted, bronze coloured, stiff, and rolled under at the margins. Management options include the preservation and introduction of predatory mites and avoiding location of new crops downwind from those infested with mites.								
Dimethoate	1B	Contact	7 G:7	A	ALL	Registered in beans for control of Aphids, Jassids, **Mites**, Leafhoppers, Green Vegetable Bug, Thrips and Wingless Grasshopper. [Max no. of applications not specified; re-treatment interval 5-7 d]	H Bee:H	R1
Paraffinic Oil	UN	Contact	NR	A	ALL (excl. QLD)	Registered in beans for control of Aphid, **Mites**, Thrips and Leaf hoppers. Use as needed. Avoid spraying open blooms. [Max 4 applications per season; re-treatment interval 14 d]	VL Bee:L	-
Sulphur	UN	Contact	NR	A	ALL	Registered in vegetables for control of **Mites**. [Max no. of applications not specified; re-treatment interval 14 d]	L Bee:L	-
Beauveria bassiana (Velifer) BASF	UN	Biological	NR	P-A	ALL	Registered in protected vegetables and ornamentals for suppression of various pests including: Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid & Two-Spotted Spider Mites.	L Bee:L	-
Abamectin	6	Contact		P		Abamectin is registered in snow and sugar snap peas, adzuki, mung beans and navy beans for various mites. There is an APVMA tMRL T0.1mg/kg - Legume vegetables {except Peas (pods and succulent = immature seeds)}	M Bee:H	-
Bifenazate (Acramite) UPL	20D	Contact & Ingestion		P		Registered for control of various mites in almonds, pome fruit, stone fruit, fruiting vegetables, cucurbits, pawpaw and strawberries. Codex MRL 7mg/kg.	L Bee:H	-
Etoxazole (Paramite) Sumitomo	10B	Contact & Ingestion		P		Registered for control of various mites in almonds, bananas, pome fruit, stone fruit, citrus, cotton, grapes, turf and fruiting vegetables.	L Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spiromesifen (Oberon) Bayer	23	Ingestion		P		Hort Innovation Data Generation Project ST19020 is undertaking trials to support a new Australian label registration for green beans, snow peas and sugar snap peas for various mite species including Broad mite and Two-spotted mites. Project is due for completion by 2023/24.	M Bee:VL	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, Bugs, **Mites** and Caterpillars.	-	-
Bean Blossom Thrips (*Megalurothrips usitatis*) **Western Flower Thrips** (*Frankliniella occidentalis*) **Priority: High**								
Bean Blossom Thrips were ranked as a high priority in VIC, QLD, NSW & WA and as a moderate priority in TAS. Western Flower Thrips were ranked as a high priority in VIC, QLD, NSW & WA and as a moderate priority in TAS. Western Flower Thrip are most abundant during spring and summer.								
Beauveria bassiana (Velifer) BASF	UN	Biological	NR	A	ALL	Registered in protected vegetables and ornamentals for suppression of various pests including: **Western Flower Thrips,** Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid & Two-Spotted Spider Mites. [Max. 3 application per crop; re-treatment interval 3-14 d]	L Bee:L	-
Chlorantraniliprole + Thiamethoxam (Durivo) Syngenta PER87051	28+4A	Contact & Ingestion	35 NG	A	QLD (within Wide Bay Burnett region)	Permitted for use as a single post plant chemigation in green beans (field) for control of Diamondback Moth, Cabbage White Butterfly, Corn Earworm, Native Budworm, Cabbage Centre Grub, Cabbage Cluster Caterpillar, Cluster Caterpillar, Cabbage Aphid, Green Peach Aphid, Silverleaf Whitefly – all biotypes, Greenhouse Whitefly, **Western Flower Thrips**, Green Vegetable Bug, Potato Moth, Tomato Thrips, Brown Sowthistle Aphid, Vegetable Leafhopper, Lucerne Leafroller, Leafhoppers (Jassids), Onion Thrips and Psyllids. [Max. 1 application per crop]. PER87051 is held by Bundaberg Fruit & Vegetable Growers Cooperative and applicable only to QLD growers in Wide Bay Burnett region.	M Bee:VH	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Dimethoate	1B	Contact	7 G:7	A	ALL	Registered in beans for control of Aphids, Jassids, Mites, Leafhoppers, Green Vegetable Bug, **Thrips** and Wingless Grasshopper. [Max no. of applications not specified; re-treatment interval 5-7 d]	H Bee:H	R1
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, **Thrips** and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-
Methomyl (Lannate) PER82428	1A	Contact	3	A	ALL	Permitted for use in legume vegetables for control of Helicoverpa spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen Bug and **Thrips** including Western Flower Thrips. [Max 6 applications per crop; re-treatment interval not specified]	H Bee:H	R2
Paraffinic Oil	UN	Contact	NR	A	ALL (excl. QLD)	Registered in beans for control of Aphid, Mites, **Thrips** and Leaf hoppers. 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 Aphids, **Thrips**, Mealybug, Two Spotted Mite, Spider-Mite & Whitefly. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, **Thrips**, Caterpillars, Leafhoppers, and Whitefly. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-
Spinetoram (Success Neo) Corteva	5	Ingestion	3	A	ALL	Registered in legume vegetables including beans for control of Caterpillars (Helicoverpa spp. & Loopers) and **Western Flower Thrips**. [Max 3 applications per crop; re-treatment 7-14 d]	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	A	ALL	Registered in legume vegetables including beans & peas for control of Loopers, Helicoverpa & **Western Flower Thrips**. [Max. 3 applications per crop; re-treatment interval 7-14 d]	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	7 G:7	A	ALL	Registered in beans for control of **Western Flower Thrips**, Green Peach Aphid and Silverleaf Whitefly. [Max. 2 applications per crop; re-treatment interval 7 d]	M Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Cyantraniliprole (Benevia) FMC PER90652	28	Ingestion	1	P-A	ALL	Permitted for use in green beans for control of Silverleaf Whitefly. Registered in eggplant for control of Silverleaf Whitefly, Cotton Bollworm, Native Budworm, Tomato Leaf Miner and suppression of Green Peach Aphid, Tomato Thrips and **Western Flower Thrips**.	M Bee:VH	-
Abamectin	6	Contact & Ingestion		P		Registered in Spinach and Silverbeet for control of **Western Flower Thrips.**	M Bee:H	-
Clitoria ternatea Extract (Sero-X) Growth Agriculture	-	Biological		P		Registered in cotton for control of *Helicoverpa* 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	-
Dimpropyridaz (Axalion) BASF	7			P		BASF has applied for registration to control Whitefly, Aphid and **Thrips** in leafy vegetables, brassica vegetables, fruiting vegetables and cucurbits. Registration is expected in 2023.	-	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and **Thrips**.		-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of **Thrips**, Bugs, Mites and Caterpillars.	-	-
Plague Thrips (*Thrips imaginis*) **Onion Thrips** (*Thrips tabaci*) **Priority: Moderate**								
Thrips were ranked as a moderate priority in VIC, QLD, NSW, WA & TAS. It can be difficult to distinguish between thrips species in the field. It is important to use different insecticide modes of action to prevent the development of resistance. MT16009 IPM Project Recommends: The use of predatory thrips, mites & bug releases, control flowering weeds, mulch and use of certified seed.								
Beauveria bassiana (Velifer) BASF	UN	Biological	NR	A	ALL	Registered in protected vegetables and ornamentals for suppression of various pests including: Western Flower Thrips, **Onion Thrips**, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid & 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
Chlorantraniliprole + Thiamethoxam (Durivo) Syngenta PER87051	28+4A	Contact & Ingestion	35 NG	A	QLD (within Wide Bay Burnett region)	Permitted for use as a single post plant chemigation in green beans (field) for control of Diamondback Moth, Cabbage White Butterfly, Corn Earworm, Native Budworm, Cabbage Centre Grub, Cabbage Cluster Caterpillar, Cluster Caterpillar, Cabbage Aphid, Green Peach Aphid, Silverleaf Whitefly – all biotypes, Greenhouse Whitefly, Western Flower Thrips, Green Vegetable Bug, Potato Moth, Tomato Thrips, Brown Sowthistle Aphid, Vegetable Leafhopper, Lucerne Leafroller, Leafhoppers (Jassids), **Onion Thrips** and Psyllids. [Max. 1 application per crop]. PER87051 is held by Bundaberg Fruit & Vegetable Growers Cooperative and applicable only to QLD growers in Wide Bay Burnett region.	M Bee:VH	R2
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, **Thrips** and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-
Maldison	1B	Contact	3	A	ALL	Registered in beans for control of Aphids, Cabbage Moth, Cabbage White Butterfly, Green Vegetable Bug, Jassids, Leafhoppers, Rutherglen Bug & **Thrips**. [Max. no. of applications and re-treatment interval not specified]	H Bee:H	-
Methomyl (Lannate) PER82428	1A	Contact	3	A	ALL	Permitted for use in legume vegetables for control of Helicoverpa spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen Bug and **Thrips** including Western Flower Thrips. [Max 6 applications per crop; re-treatment interval not specified]	H Bee:H	R2
Paraffinic Oil	UN	Contact	NR	A	ALL (excl. QLD)	Registered in beans for control of Aphid, Mites, **Thrips** and Leaf hoppers. 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 Aphids, **Thrips**, Mealybug, Two Spotted Mite, Spider-Mite & Whitefly. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, **Thrips**, Caterpillars, Leafhoppers, and Whitefly. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-
Cyantraniliprole (Benevia) FMC PER90652	28	Ingestion	1	P-A	ALL	Permitted for use in green beans for control of Silverleaf Whitefly. Registered for suppression of **Onion Thrips** in bulb vegetables and strawberry and suppression of **Plague Thrips** in potato and strawberry.	M Bee:VH	-
Spinetoram (Success Neo) Corteva	5	Ingestion	3	P-A	ALL	Registered in legume vegetables including beans for control of Caterpillars (Helicoverpa spp. & Loopers) and Western Flower Thrips.	M Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	P-A	ALL	Registered in legume vegetables including beans & peas for control of Loopers, Helicoverpa & Western Flower Thrips.	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	7 G:7	P-A	ALL	Registered in beans for control of Western Flower Thrips, Green Peach Aphid and Silverleaf Whitefly. Registered for control of **Plague Thrips** in herbs.	M Bee:VL	-
Clitoria ternatea Extract (Sero-X) Growth Agriculture	-	Biological		P		Registered in cotton for control of *Helicoverpa* 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	-
Dimpropyridaz (Axalion) BASF	7			P		BASF has applied for registration to control Whitefly, Aphid and **Thrips** in leafy vegetables, brassica vegetables, fruiting vegetables and cucurbits. Registration is expected in 2023.	-	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and **Thrips**.		-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of **Thrips**, Bugs, Mites and Caterpillars.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Bean Spider Mite (*Tetranychus ludeni*) **Two-Spotted Mite** (*Tetranychus urticae*) **Priority: Moderate**								
Bean Spider Mite was ranked as a moderate priority in VIC, QLD, NSW & WA and as a low priority in TAS. Spider Mites are often an end of season pest, flaring when pesticide applications targeting other pests kill off predators that are keeping the mite populations in check. They feed on aerial parts of the plant with the damage caused providing entry points for fungal and bacterial diseases.								
Dimethoate	1B	Contact	7 G:7	A	ALL	Registered in beans for control of **Spider Mites**, Thrips, Bean Fly & Green Vegetable Bug. Apply at 3 and 7 d after crop emergence. [Max. 2 applications per crop; re-treatment interval 21 d]	H Bee:H	R1
Paraffinic Oil	UN	Contact	NR	A	ALL (excl. QLD)	Registered in beans for control of Aphid, **Mites**, Thrips and Leaf hoppers. Use as needed. 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 Aphids, Thrips, Mealybug, **Two Spotted Mite**, **Spider-Mite** & Whitefly. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-
Propargite (Omite)	12C	Contact	7	A	ALL	Registered in vegetables for control of **Spider Mite** and **Two-Spotted Mite**. [Max no. of applications not specified; re-treatment interval 10-14 d].	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	-
Beauveria bassiana (Velifer) BASF	UN	Biological	NR	P-A	ALL	Registered in protected vegetables and ornamentals for suppression of various pests including: Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid & Two-Spotted Spider Mites.	L Bee:L	-
Bifenthrin (Astral)	3A	Contact	14 G:14	P-A	ALL	Registered in beans (common – fresh and processing) for control of Silverleaf Whitefly. Registered for control of various Mites in banana, fruiting vegetables, pulse crops, and various broadacre crops.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Abamectin	6	Contact		P		Abamectin is registered in snow and sugar snap peas, adzuki, mung beans and navy beans for various mites. There is an APVMA tMRL T0.1mg/kg - Legume vegetables {except Peas (pods and succulent = immature seeds)}	M Bee:H	-
Cyflumetofen (Danisaraba) BASF	25A	Contact		P		BASF is seeking registration in Australia for the control of Spider Mites in various crops. US registration for control of Spider Mites in citrus, grapes, pome fruit, stone fruit, tomato, tree nuts and ornamentals.	L Bee L	-
Spiromesifen (Oberon) Bayer	23	Ingestion		P		Hort Innovation Data Generation Project ST19020 is undertaking trials to support a new Australian label registration for green beans, snow peas and sugar snap peas for various mite species including Broad Mite and Two-Spotted Mites. Project is due for completion by 2023/24.	M Bee:VL	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, Bugs, **Mites** and Caterpillars.	-	-
Rutherglen Bug (*Nysius vinitor*) **Priority: Moderate**								
Rutherglen Bug was ranked as a moderate priority in VIC, QLD, NSW & WA and as a low priority in TAS. They breed on weeds, moving to available crops or weeds when hosts die off. It is important to monitor crops for eggs and nymphs by regular field scouting. Repeated influxes of migrating adults can make repeat insecticide applications necessary. Large numbers can cause significant feeding damage to foliage by sucking the sap and depleting the crop of nutrients.								
Maldison	1B	Contact	3	A	ALL	Registered in beans for control of Aphids, Cabbage Moth, Cabbage White Butterfly, Green Vegetable Bug, Jassids, Leafhoppers, **Rutherglen Bug** & Thrips. [Max. no. of applications and re-treatment interval not specified]	H Bee:H	-
Methomyl (Lannate) PER82428	1A	Contact	3	A	ALL	Permitted for use in legume vegetables for control of Helicoverpa spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, **Rutherglen Bug** and Thrips including Western Flower Thrips. [Max 6 applications per crop; re-treatment interval not specified]	H Bee:H	R2

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 Cutworm, Vegetable Bug and **Rutherglen Bug**. [Max no. of applications not specified; re-treatment: 7-10 d]	H Bee:H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. Bayer label extension submitted in October 2020 to include whitefly in vegetables such as cucurbits, eggplant, peppers, green beans, potatoes, sweet potatoes, and aphids in cucurbits & potatoes.	L Bee:L	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, **Bugs**, Beetles/Weevils, Fruit Fly and Thrips.		-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of Green Peach Aphid, Brown Sowthistle Aphid, Turnip Aphid, Cabbage Aphid, **Rutherglen Bug** and Greenhouse Whitefly in leafy vegetables.	M Bee:VH	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, **Bugs**, Mites and Caterpillars.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Green Vegetable Bug (*Nezara viridula*) **Priority: Moderate**								
Green Vegetable Bug was ranked as a high priority in VIC, as a moderate priority in QLD, NSW & WA and as a low priority in TAS. These bugs use their long, thin mouthpart to suck nutrients from the aerial parts of the plant. It emits a foul smell when disturbed to deter predators. The nymphs are attacked by ants, spiders & predatory bugs. It is important to monitor crops for eggs and nymphs of pest species by regular field scouting. Target sprays against mature eggs and nymphs before pests become entrenched.								
Chlorantraniliprole + Thiamethoxam (Durivo) Syngenta PER87051	28+4A	Contact & Ingestion	35 NG	A	QLD (within Wide Bay Burnett region)	Permitted for use as a single post plant chemigation in green beans (field) for control of Diamondback Moth, Cabbage White Butterfly, Corn Earworm, Native Budworm, Cabbage Centre Grub, Cabbage Cluster Caterpillar, Cluster Caterpillar, Cabbage Aphid, Green Peach Aphid, Silverleaf Whitefly – all biotypes, Greenhouse Whitefly, Western Flower Thrips, **Green Vegetable Bug**, Potato Moth, Tomato Thrips, Brown Sowthistle Aphid, Vegetable Leafhopper, Lucerne Leafroller, Leafhoppers (Jassids), Onion Thrips and Psyllids. [Max. 1 application per crop]. PER87051 is held by Bundaberg Fruit & Vegetable Growers Cooperative and applicable only to QLD growers in Wide Bay Burnett region.	M Bee:VH	R2
Dimethoate	1B	Contact	7 G:7	A	ALL	Registered in beans for control of Spider Mites, Thrips, Bean Fly & **Green Vegetable Bug**. Apply at 3 and 7 d after crop emergence. [Max. 2 applications per crop; re-treatment interval 21 d]	H Bee:H	R1
Maldison	1B	Contact	3	A	ALL	Registered in beans for control of Aphids, Cabbage Moth, Cabbage White Butterfly, **Green Vegetable Bug**, Jassids, Leafhoppers, Rutherglen Bug & Thrips. [Max. no. of applications and re-treatment interval not specified]	H Bee:H	-
Trichlorfon (Lepidex)	1B	Contact	2	A	ALL	Registered in vegetables for control of Cutworm, **Vegetable Bug** and Rutherglen Bug. [Max no. of applications not specified; re-treatment: 7-10 d]	H Bee:H	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Methomyl (Lannate) PER82428	1A	Contact	3	P-A	ALL	Permitted for use in legume vegetables for control of Helicoverpa spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. Registered for control of **Green Vegetable Bug** in pulse crops, sunflower and tomato.	H Bee:H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. Bayer label extension submitted in October 2020 to include whitefly in vegetables such as cucurbits, eggplant, peppers, green beans, potatoes, sweet potatoes, and aphids in cucurbits & potatoes.	L Bee:L	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, **Bugs**, Beetles/Weevils, Fruit Fly and Thrips.		-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, **Bugs**, Mites and Caterpillars.	-	-
Bean Fly (*Ophiomyia phaseoli*) **Priority: Moderate**								
Bean Fly was ranked as a moderate priority in QLD, NSW & WA and as a low priority in VIC & TAS. The larvae damage stems by tunnelling in the vascular tissue. Severe infestations can lead to premature plant death, especially in seedlings.								
Dimethoate	1B	Contact	7 G:7	A	ALL	Registered in beans for control of Spider Mites, Thrips, **Bean Fly** & Green Vegetable Bug. Apply at 3 and 7 d after crop emergence. [Max. 2 applications per crop; re-treatment interval 21 d]	H Bee:H	R1

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Silverleaf Whitefly (*Bemisia tabaci*) **Priority: Moderate**								
Silverleaf Whitefly was ranked as a moderate priority in QLD, NSW & WA and as a low priority in VIC & TAS. High reproduction rates and short generation time can lead to rapid population increases. Adults and nymphs feed on the sap and create honeydew which can impact on yield and produce quality. It is also a vector for the Carlavirus Cowpea Mild Mottle Virus, which is a seasonal problem in South East Queensland. Relatively low whitefly numbers can lead to significant spreading of this virus in beans.								
Beauveria bassiana (Velifer) BASF	UN	Biological	NR	A	ALL	Registered in protected vegetables and ornamentals for suppression of various pests including: Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, **Silverleaf Whitefly**, Sweet Potato Whitefly, Green Peach Aphid & Two-Spotted Spider Mites. [Max. 3 application per crop; re-treatment interval 3-14 d]	L Bee:L	-
Bifenthrin (Astral)	3A	Contact	14 G:14	A	ALL	Registered in beans (common – fresh and processing) for control of **Silverleaf Whitefly**. [Max. 2 application per crop; min. re-treatment interval 7 d]	VH Bee:H	-
Chlorantraniliprole + Thiamethoxam (Durivo) Syngenta PER87051	28+4A	Contact & Ingestion	35 NG	A	QLD (within Wide Bay Burnett region)	Permitted for use as a single post plant chemigation in green beans (field) for control of Diamondback Moth, Cabbage White Butterfly, Corn Earworm, Native Budworm, Cabbage Centre Grub, Cabbage Cluster Caterpillar, Cluster Caterpillar, Cabbage Aphid, Green Peach Aphid, **Silverleaf Whitefly** – all biotypes, Greenhouse Whitefly, Western Flower Thrips, Green Vegetable Bug, Potato Moth, Tomato Thrips, Brown Sowthistle Aphid, Vegetable Leafhopper, Lucerne Leafroller, Leafhoppers (Jassids), Onion Thrips and Psyllids. [Max. 1 application per crop]. PER87051 is held by Bundaberg Fruit & Vegetable Growers Cooperative and applicable only to QLD growers in Wide Bay Burnett region.	M Bee:VH	R2
Cyantraniliprole (Benevia) FMC PER90652	28	Ingestion	1	A	ALL	Permitted for use in green beans for control of **Silverleaf Whitefly**. [Max. 2 application per crop]	M Bee:VH	-

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 vegetables for control of Ants, Aphids, Caterpillars, Earwigs, **Whitefly,** Thrips and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-
Imidacloprid (Confidor) PER85103	4A	Contact & Ingestion	NR G:42	A	QLD	Permitted for use in green beans for control of **Silverleaf Whitefly**. [Max. 1 application per crop]	M Bee:M	R2
Potassium Salts of Fatty Acids (Natrasoap)	-	Contact	NR	A	ALL	Registered in vegetables for control of Aphids, Thrips, Mealybug, Two Spotted Mite, Spider-Mite & **Whitefly**. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, Thrips, Caterpillars, Leafhoppers, and **Whitefly**. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-
Pyriproxyfen (Admiral) Sumitomo PER84890	7C	Ingestion	1 NG	A	ALL (excl. VIC)	Permitted for use in beans (all types) for control of **Silverleaf whitefly** in beans. [Max. 2 applications per crop; re-treatment interval 14 d]	VL Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	7 G:7	A	ALL	Registered in beans for control of Western Flower Thrips, Green Peach Aphid and **Silverleaf Whitefly**. [Max. 2 applications per crop; re-treatment interval 7 d]	M Bee:VL	-
Afidopyropen (Versys) BASF	9D	Ingestion		P		Hort Innovation Data Generation Project ST17000 is undertaking trials to support a label extension for green beans, snow peas and sugar snap peas for aphids and Silverleaf whitefly with BASF. Project is due for completion by the end of 2021.	L Bee:L	-
Clitoria ternatea Extract (Sero-X) Growth Agriculture	-	Biological		P		Registered in cotton for control of *Helicoverpa* 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	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Dimpropyridaz (Axalion) BASF	7			P		BASF has applied for registration to control **Whitefly**, Aphid and Thrips in leafy vegetables, brassica vegetables, fruiting vegetables and cucurbits. Registration is expected in 2023.	-	-
Flonicamid (Mainman) ISK	29	Ingestion		P		Registered for control of Aphids and **Silverleaf Whitefly** in cucurbits; Aphids in potatoes; Aphids and Mealybugs in apples and pears; and Aphids and Mirids in cotton. US registration for control of Aphids and Plant Bugs in legume vegetables.	M Bee:L	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. Bayer label extension submitted in October 2020 to include whitefly in vegetables such as cucurbits, eggplant, peppers, green beans, potatoes, sweet potatoes, and aphids in cucurbits & potatoes.	L Bee:L	-
NUL3145 Nufarm	TBC			P		New product from Nufarm with activity on Scale, Nematodes, Mealybug and **Whitefly**.	-	-
Green Peach Aphid (*Myzus persicae*) **Priority: Low**								
Green Peach Aphid was ranked as a moderate priority in VIC, NSW & WA and as a low priority in QLD & TAS. Green Peach Aphids suck on sap, causing loss of vigour, and in some cases yellowing, stunting or distortion of plant parts. Honeydew secreted by the insects can cause sooty mould to develop on leaves. Aphids can also be vectors for viruses.								
Beauveria bassiana (Velifer) BASF	UN	Biological	NR	A	ALL	Registered in protected vegetables and ornamentals for suppression of various pests including: Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, **Green Peach Aphid** & 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
Chlorantraniliprole + Thiamethoxam (Durivo) Syngenta PER87051	28+4A	Contact & Ingestion	35 NG	A	QLD (within Wide Bay Burnett region)	Permitted for use as a single post plant chemigation in green beans (field) for control of Diamondback Moth, Cabbage White Butterfly, Corn Earworm, Native Budworm, Cabbage Centre Grub, Cabbage Cluster Caterpillar, Cluster Caterpillar, Cabbage Aphid, **Green Peach Aphid**, Silverleaf Whitefly – all biotypes, Greenhouse Whitefly, Western Flower Thrips, Green Vegetable Bug, Potato Moth, Tomato Thrips, Brown Sowthistle Aphid, Vegetable Leafhopper, Lucerne Leafroller, Leafhoppers (Jassids), Onion Thrips and Psyllids. [Max. 1 application per crop]. PER87051 is held by Bundaberg Fruit & Vegetable Growers Cooperative and applicable only to QLD growers in Wide Bay Burnett region.	M Bee:VH	R2
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, **Aphids**, Caterpillars, Earwigs, Whitefly, Thrips and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-
Potassium Salts of Fatty Acids (Natrasoap)	-	Contact	NR	A	ALL	Registered in vegetables for control of **Aphids**, Thrips, Mealybug, Two Spotted Mite, Spider-Mite & Whitefly. [Max no. of applications not specified; re-treatment interval 5-7 d]	L Bee:L	-
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, **Aphids**, Thrips, Caterpillars, Leafhoppers, and Whitefly. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-
Spirotetramat (Movento) Bayer	23	Ingestion	7 G:7	A	ALL	Registered in beans for control of Western Flower Thrips, **Green Peach Aphid** and Silverleaf Whitefly. [Max. 2 applications per crop; re-treatment interval 7 d]	M Bee:VL	-
Pirimicarb (Aphidex)	1A	Contact	2	P-A	VIC, TAS & WA	Registered in beans for control of Cowpea Aphid.	VL Bee:VL	R3
Afidopyropen (Versys) BASF	9D	Ingestion		P		Hort Innovation Data Generation Project ST17000 is undertaking trials to support a label extension for green beans, snow peas and sugar snap peas for aphids and Silverleaf whitefly with BASF. Project is due for completion by the end of 2021.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Dimpropyridaz (Axalion) BASF	7			P		BASF has applied for registration to control Whitefly, **Aphid** and Thrips in leafy vegetables, brassica vegetables, fruiting vegetables and cucurbits. Registration is expected in 2023.	-	-
Flonicamid (Mainman) ISK	29	Ingestion		P		Registered for control of **Aphids** and Silverleaf Whitefly in cucurbits; **Aphids** in potatoes; **Aphids** and Mealybugs in apples and pears; and **Aphids** and Mirids in cotton. US registration for control of **Aphids** and Plant Bugs in legume vegetables.	M Bee:L	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. Bayer label extension submitted in October 2020 to include whitefly in vegetables such as cucurbits, eggplant, peppers, green beans, potatoes, sweet potatoes, and aphids in cucurbits & potatoes.	L Bee:L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of **Green Peach Aphid**, Brown Sowthistle Aphid, Turnip Aphid, Cabbage Aphid, Rutherglen Bug and Greenhouse Whitefly in leafy vegetables.	M Bee:VH	-
Looper Caterpillar (*Chrysodeixis* spp.) **Priority: Low**								
Looper Caterpillars were ranked as a moderate priority in VIC and as a low priority in QLD, NSW, WA & TAS. The last two larval instars are the most voracious feeders and will usually eat the entire leaf but may avoid the midrib or other large veins. 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.								
Bacillus thuringiensis subsp. kurstaki (DiPel)	11A	Biological	NR	A	ALL	Registered in vegetables for control of **Caterpillars**. [Apply a minimum of 2 sprays, 3 d apart; re-treatment interval 3-5 d]	VL Bee:L	-
Emamectin (Proclaim Opti)	6	Contact & ingestion	3 G:21	A	ALL	Registered in legume vegetables including Green Beans for control of Helicoverpa and **Looper caterpillars**. Apply when larvae are small. [Max 4 application per year; re-treatment interval 7 d].	M Bee:H	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, **Caterpillars**, Earwigs, Whitefly, Thrips and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Methomyl (Lannate) PER82428	1A	Contact	3	A	ALL	Permitted for use in legume vegetables for control of Helicoverpa spp. Cucumber Moth, Cluster Caterpillar, **Loopers**, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. [Max 6 applications per crop; re-treatment interval not specified]	H Bee:H	R2
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, Thrips, **Caterpillars**, Leafhoppers, and Whitefly. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-
Spinetoram (Success Neo) Corteva	5	Ingestion	3	A	ALL	Registered in legume vegetables including beans for control of Caterpillars (Helicoverpa spp. & **Loopers**) and Western Flower Thrips. [Max 3 applications per crop; re-treatment 7-14 d]	M Bee:H	-
Spinosad (Entrust Organic)	5	Contact & ingestion	3 G:14	A	ALL	Registered in legume vegetables including beans & peas for control of **Loopers**, Helicoverpa & Western Flower Thrips. [Max. 3 applications per crop; re-treatment interval 7-14 d]	L Bee:L	-
Chlorantraniliprole (Coragen) FMC	28	Ingestion	1	P-A	ALL	Registered in green beans for control of *Helicoverpa*. Registered for control of Loopers in brassica vegetables.	L Bee:VL	-
Indoxacarb + Novaluron (Plemax) Adama	22A+15	Contact & Ingestion		P		Registered for the control of various Lepidoptera in brassica vegetables, leafy vegetables and fruiting vegetables.	M Bee:H	R3
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on **Lepidoptera**, Bugs, Beetles/Weevils, Fruit Fly and Thrips.	-	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, Bugs, Mites and **Caterpillars**.	-	-
Tetraniliprole (Vayego) Bayer	28	Disrupts feeding		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.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Grass Blue Butterfly (*Zizina labradus*) **Priority: Low** (VIC & SA only)								
Grass Blue Butterfly was ranked as a moderate priority in VIC & TAS. Larvae feed on leaves but are most damaging when feeding on growing terminals. 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.								
Bacillus thuringiensis subsp. kurstaki (DiPel)	11A	Biological	NR	A	ALL	Registered in vegetables for control of **Caterpillars**. [Apply a minimum of 2 sprays, 3 d apart; re-treatment interval 3-5 d]	VL Bee:L	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, **Caterpillars**, Earwigs, Whitefly, Thrips and Leafhoppers. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-
Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in vegetables for control of Ants, Aphids, Thrips, **Caterpillars**, Leafhoppers, and Whitefly. [Max no. of applications not specified; re-treatment interval: 7 d]	VH Bee:H	-
Spinosad (Entrust Organic) Corteva	5	Ingestion		P-A		Registered in Legume vegetables including beans for control of Loopers, Helicoverpa & Western Flower Thrips.	L Bee:H	-
Indoxacarb + Novaluron (Plemax) Adama	22A+15	Contact & Ingestion		P		Registered for the control of various Lepidoptera in brassica vegetables, leafy vegetables and fruiting vegetables.	M Bee:H	R3
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on **Lepidoptera**, Bugs, Beetles/Weevils, Fruit Fly and Thrips.	-	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, Bugs, Mites and **Caterpillars**.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Green Snails (*Cornu apertus*) **Priority: Low**								
Green Snails were ranked as a moderate priority in WA. They are active after dusk when chemical treatments can be effective. Growers in WA must treat perimeters with Mesurol (need certification for green snails).								
Iron EDTA Complex	-	Contact & Ingestion	NR	A	ALL	Registered in crops for the control of **Snails** & Slugs. Spread pellets evenly on ground. [Max no. of applications and re-treatment not specified]	-	-
Metaldehyde (Sabakem)	-	Contact & Ingestion	7	A	ALL	Registered in vegetables for the control of **Snails** & Slugs. Spread pellets evenly on ground. [Max no. of applications and re-treatment not specified]	-	-
Methiocarb (Mesurol)	1A	Contact & Ingestion	NR	A	ALL	Registered in vegetables for control of **Snails** & Slugs. [Max no. of applications and re-treatment not specified]	-	R2
Fall Armyworm (*Spodoptera frugiperda*) **Priority: Unknown**								
Fall armyworm was not ranked as a pest in beans. It is an exotic pest that is considered a potential threat that could affect most vegetable crops if allowed to spread. It is important to monitor crops for eggs and larvae of pest species by regular field scouting. Target sprays against mature eggs and newly hatched larvae before pests become entrenched.								
Chlorantraniliprole (Coragen) PER89259	28	Ingestion	1	A	ALL (excl. VIC)	Permitted for use in legume vegetables for control of **Fall Armyworm.** [Max. 3 applications per crop; 2 consecutive; re-treatment interval 7 d]	L Bee:VL	-
Emamectin (Proclaim Opti) PER89263	6	Ingestion	3 NG	A	ALL (excl. VIC)	Permitted for use in legume vegetables (field grown and protected cropping) for control of **Fall Armyworm.** [Max 4 applications per crop; re-treatment interval: 7 d]	M Bee:H	-
Methomyl (Lannate) PER89293	1A	Contact	1	A	ALL	Permitted for use in legume vegetables (field) for control of **Fall Armyworm**. [Max 6 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 for use in sweet corn, brassica vegetables, brassica leafy vegetables, stalk and stem vegetables, leafy vegetables, fruiting vegetables (including cucurbits), legume vegetables, stalk and stem vegetables, culinary herbs, root and tuber vegetables and several fruits 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	Ingestion	3 G:14	A	ALL (excl. VIC)	Permitted for use in legume vegetables (succulent seeds & immature pods only) for control of **Fall Armyworm.** [Max. 3 applications per season; re-treatment interval 7-14 d]	L Bee:L	-
Spodoptera frugiperda Multiple Nucleopolyhedrovirus (Fawligen) AgBiTech PER90820	31	Biological	NR	A	ALL	Permitted for use in legume vegetables for control of **Fall Armyworm**. [Max 5 applications per crop; Min. re-treatment interval: 7 d]	VL L-Bees	-
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.	-	-
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered in Brassica leafy vegetables for control of various **Lepidoptera**.	L Bee:H	R3
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on **Lepidoptera**, Bugs, Beetles/Weevils, Fruit Fly and Thrips.	-	-
SYNFOI21 Syngenta	TBC			P		SYNFOI21 is not registered but the first global application is proposed for 2023 for control of Thrips, Bugs, Mites and **Caterpillars**.	-	-
Tetraniliprole (Vayego 200 SC) Bayer	28	Ingestion		P		Tetraniliprole differs from most other group 28 insecticides as the spectrum of control expands beyond Lepidoptera control to include Coleoptera and Diptera plus other specific sucking pests. Label registration in vegetable crops in Indonesia for Leafminers - *Liriomyza huidobrensis* and Fall armyworms (FAW) *Spodoptera frugiperda.*	M Bee:VH	

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Leaf Miners (*Liriomyza* spp.) **Priority: Unknown**								
Leafminer was not ranked as a pest in green beans. Dipteran leaf miners (*Liriomyza* spp.) are exotic pests that have recently been detected and become problematic in Australia. For example, the Serpentine leaf miner 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.								
Abamectin PER81876	6	Contact	14 NG	A	ALL (excl. VIC)	Permitted use in legume vegetables for the control of ***Liriomyza* spp.** [Max 2 applications per crop; Re-treatment interval: 7-14 d]	M Bee:H	-
Cyromazine (Diptex) PER81867	17	Ingestion	7	P	ALL	Permitted use in legume vegetables for the control of ***Liriomyza* spp.** [Max 6 applications per crop; Min. re-treatment interval: 7 d]	-	-
Spinetoram (Succcess Neo) PER87878 Corteva	5	Ingestion	3 NG	P	ALL	Permitted use in legume vegetables for the control of ***Liriomyza* spp.** [Max 3 applications per crop; Re-treatment interval: 7-14 d]	M Bee:H	-
Spinosad (Entrust Organic) Corteva PER90928	5	Ingestion	3 G:14	A	ALL (excl. VIC)	Permitted for use in legume vegetables for control of **Liriomyza Leafminers**. [Max. 3 applications per crop; min. re-treatment interval 4 d]	L Bee:L	-
Spirotetramat (Movento) Bayer PER88640	23	Ingestion	7 G:7	A	ALL (excl. VIC)	Permitted for use in beans for control of **Liriomyza Leafminers (*Liriomyza* spp.**) Field cropping systems only. [Max. 3 applications per crop; re-treatment interval 7 d]	M Bee:VL	-
Chlorantraniliprole (Coragen) FMC	28	Ingestion	3	P-A	ALL	Registered in legume vegetables including snow and sugar snap peas for control of *Helicoverpa*. Permitted for control of **Liriomyza Leafminers** in spinach and silverbeet.	L Bee:VL	-
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Permitted for control of **Liriomyza Leafminers** in bulb vegetables, fruiting vegetables and potatoes.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Tetraniliprole (Vayego 200 SC) Bayer	28	Disrupts feeding		P		Tetraniliprole differs from most other group 28 insecticides as the spectrum of control expands beyond Lepidoptera control to include Coleoptera and Diptera plus other specific sucking pests. Label registration in vegetable crops in Indonesia for Leafminers - *Liriomyza huidobrensis* and Fall armyworms (FAW) *Spodoptera frugiperda*	M Bee:VH	

4.3 Weeds in Green Beans

4.3.1 Weed priorities

Common name	Scientific name
Moderate	
Fat Hen	*Chenopodium album*
Amaranthus	*Amaranthus* spp.
Field Bindweed	*Convolvulus arvensis L.*
Cat's Whiskers	*Cleome* spp.
Wild Radish	*Raphanus raphanistrum*
Pigweed	*Portulaca* spp.
Annual Ryegrass	*Lolium rigidum*
Blackberry Nightshade	*Solanum nigrum*
Common Thornapple	*Datura stramonium*
Volunteer Potato	*Solanum tuberosum*
Low	
Marshmallow	*Malva parviflora*

Fat Hen was ranked as a moderate priority in VIC, QLD & WA in the recent survey whilst the others were ranked as a moderate priority in single jurisdictions. Management options include soil fumigation, pre-crop spraying, spot spraying, or using mechanical devices.

Weed control in many cases is aided by soil fumigation, which also helps in controlling some soil borne pests and pathogens.

Resistance management
Of the weeds listed in the table above there are confirmed cases of resistance in Australia for Blackberry Nightshade (Group L at 2 sites).

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 webpage.
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
Fat Hen (*Chenopodium album*) **Priority: Moderate**							
Fat Hen was ranked as a moderate priority in VIC, QLD & WA. Herbicide control can be difficult and targeting weeds at early growth stages is critical.							
Bentazone (Basagran)	C**	Green beans (French Dwarf) / Selective post-emergent	Registered in green beans for control of broadleaf weeds including **Fat Hen**. [Max no. of applications and re-treatment interval not specified]	35	A	ALL	-
Chlorthal-Dimethyl (Dacthal)	D**	Beans / Pre-emergent	Registered in beans for control of various grass and broadleaf weeds including **Fat Hen**. Spray at transplanting.	NR	A	ALL	-
Clomazone	Q**	Green beans / Pre-emergent residual	Registered in beans for control of broadleaf weeds, including **Fat Hen**. [Max 3 applications per crop; re-treatment interval not specified]	NR	A	ALL	-
Dimethenamid-P (Outlook) BASF	K**	Green beans / residual / Pre-emergent	Registered in beans for control of broadleaf weeds including **Fat Hen**. Irrigation or rain is required within 7 days of application. [Max no. of applications and re-treatment interval not specified]	NR G:28	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Glufosinate-Ammonium (Basta)	N**	Green bean / Post-emergent	Registered in green bean for control of grass and broadleaf weeds including **Fat Hen**. Apply with an inter-row shielded sprayer. [Max. 1 application per season]	28	A	ALL	R3
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Fat Hen**, as a pre-crop spray.	NR	A	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	K**	Green beans / Pre-emergent	Registered in green bean for control of grass and broadleaf weeds, including **Fat Hen**. Irrigation or rain is required within 10 days of application. [Max. 1 application per season]	56 G:70	A	ALL (excl. WA)	-
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Fat Hen**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	D**	French Beans / Pre-Emergent	Registered in French beans for control of grass and broadleaf weeds, including **Fat Hen**. Do not apply to crops sown during autumn, winter or early spring.	NR	A	QLD, TAS	-
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		-
Metribuzin	C**		Registered in Faba beans for control of broadleaf weeds including **Fat Hen**.		P		-
Norflurazon (Zoliar) Agnova	F**		Registered in asparagus, citrus, grapes, nuts, stone & pome fruits for control of grass and broadleaf weeds including **Fat Hen**.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Amaranthus (*Amaranthus* spp.) **Priority: Moderate**							
Amaranthus was ranked as a moderate priority in QLD & TAS. It is a short-lived annual weed that can pose a problem every year as they are prolific seed producers.							
Acifluorfen (Blazer)	G**	Green Beans / Post-emergent	Registered in green beans for control of **Prince of Wales Feather** (*Amaranthus powellii*). Apply after the fully expanded unifoliate leaf stage of the crop, when the crop is at 6-7 leaf stage and/or when crop is at early flowering stage. [Max. 3 applications per crop]	28	A	ALL	-
Chlorthal-Dimethyl (Dacthal)	D**	Beans / Pre-emergent	Registered in beans for control of various grass and broadleaf weeds including **Amaranthus**. Spray at transplanting.	NR	A	ALL	-
Clomazone	Q**	Green beans / Pre-emergent residual	Registered in beans for control of broadleaf weeds, including suppression of **Amaranth**. [Max 3 applications per crop; re-treatment interval not specified]	NR	A	ALL	-
Dimethenamid-P (Outlook) BASF	K**	Green beans / residual / Pre-emergent	Registered in beans for control of broadleaf weeds including **Amaranthus**. Irrigation or rain is required within 7 days of application. [Max no. of applications and re-treatment interval not specified]	NR G:28	A	ALL	-
Glufosinate-Ammonium (Basta)	N**	Green bean / Post-emergent	Registered in green bean for control of grass and broadleaf weeds including **Amaranthus**. Apply with an inter-row shielded sprayer. [Max. 1 application per season]	28	A	ALL	R3
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Amaranthus**, as a pre-crop spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Amaranthus**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	K**	Green beans / Pre-emergent	Registered in green bean for control of grass and broadleaf weeds, including **Powells Amaranth**. Irrigation or rain is required within 10 days of application. [Max. 1 application per season]	56 G:70	A	ALL (excl. WA)	-
Trifluralin	D**	Green Beans / Pre-emergent	Registered in green beans for control of grass and broadleaf weeds, including **Amaranth**. Must be incorporated by cultivation within 4 hours of application.	NR	A	ALL	-
Fluroxypyr (Starane)	I**		Registered for control of broadleaf weeds, including **Amaranthus** in broadacre crops.		P		-
Metribuzin	C**		Registered in Faba beans for control of broadleaf weeds including **Amaranthus**.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Field Bindweed (*Convolvulus arvensis L.*) **Priority: Moderate**							
Field Bindweed was ranked as a moderate priority in QLD.							
Glufosinate-Ammonium (Basta)	N**	Green bean / Post-emergent	Registered in green bean for control of grass and broadleaf weeds including **Bindweed**. Apply with an inter-row shielded sprayer. [Max. 1 application per season]	28	A	ALL	R3
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Bindweed**, as a pre-crop spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Bindweed**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Cat's Whiskers (*Cleome* spp.) **Priority: Moderate**							
Cat's Whiskers were ranked as a moderate priority in QLD.							
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Cat's Whiskers**, as a pre-crop spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L***	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Cat's Whiskers**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Wild Radish (*Raphanus raphanistrum*) **Priority: Moderate**							
Wild Radish was ranked as a moderate priority in QLD. It is a Winter growing weed that competes aggressively with crops and runs to seed quickly.							
Bentazone (Basagran)	C**	Green beans (French Dwarf) / Selective post-emergent	Registered in green beans for control of broadleaf weeds including **Wild Radish**. [Max no. of applications and re-treatment interval not specified]	35	A	ALL	-
Glufosinate-Ammonium (Basta)	N**	Green bean / Post-emergent	Registered in green bean for control of grass and broadleaf weeds including **Wild Radish**. Apply with an inter-row shielded sprayer. [Max. 1 application per season]	28	A	ALL	R3
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Wild Radish**, as a pre-crop spray.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Wild Radish**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	D**	French Beans / Pre-Emergent	Registered in French beans for control of grass and broadleaf weeds, including suppression of **Wild Radish**. Do not apply to crops sown during autumn, winter or early spring.	NR	A	QLD, TAS	-
Acifluorfen (Blazer)	G**	Green Beans / Post-emergent	Registered in green beans for control of Prince of Wales Feather. Registered for control of **Wild Radish** in soybeans, peanuts, mung beans and adzuki beans.	28	P-A	ALL	-
Fluroxypyr (Starane)	I**		Registered for control of broadleaf weeds, including **Wild Radish** in winter cereals.		P		-
Imazamox (Raptor) BASF	B***		Permitted for use in Faba beans for control of broadleaf weeds, including **Wild Radish**.		P		-
Imazethapyr (Spinnaker) BASF	B***		Registered in Faba beans for control of grass and broadleaf weeds, including **Wild Radish**.		P		-
Norflurazon (Zoliar) Agnova	F**		Registered in asparagus, citrus, grapes, nuts, stone & pome fruits for control of grass and broadleaf weeds including **Wild Radish**.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Pigweed (*Portulaca* spp.) **Priority: Moderate**							
Pigweed was ranked as a moderate priority in QLD. Summer growing weed that competes aggressively in-crop and can be difficult to control with herbicides.							
Chlorthal-Dimethyl (Dacthal)	D**	Beans / Pre-emergent	Registered in beans for control of various grass and broadleaf weeds including **Pigweed**. Spray at transplanting.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Clomazone	Q**	Green beans / Pre-emergent residual	Registered in beans for control of broadleaf weeds, including **Pigweed**. [Max 3 applications per crop; re-treatment interval not specified]	NR	A	ALL	-
Dimethenamid-P (Outlook) BASF	K**	Green beans / residual / Pre-emergent	Registered in beans for control of broadleaf weeds including **Pigweed**. Irrigation or rain is required within 7 days of application. [Max no. of applications and re-treatment interval not specified]	NR G:28	A	ALL	-
Glufosinate-Ammonium (Basta)	N**	Green bean / Post-emergent	Registered in green bean for control of grass and broadleaf weeds including **Pigweed**. Apply with an inter-row shielded sprayer. [Max. 1 application per season]	28	A	ALL	R3
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Pigweed**, as a pre-crop spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Pigweed**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	D**	French Beans / Pre-Emergent	Registered in French beans for control of grass and broadleaf weeds, including **Pigweed**. Do not apply to crops sown during autumn, winter or early spring.	NR	A	QLD, TAS	-
S-Metolachlor (Dual Gold) Syngenta	K**	Green beans / Pre-emergent	Registered in green bean for control of grass and broadleaf weeds, including suppression of **Pigweed**. Irrigation or rain is required within 10 days of application. [Max. 1 application per season]	56 G:70	A	ALL (excl. WA)	-
Trifluralin	D**	Green Beans / Pre-emergent	Registered in green beans for control of grass and broadleaf weeds, including **Pigweed**. Must be incorporated by cultivation within 4 hours of application.	NR	A	ALL	-
Acifluorfen (Blazer)	G**	Green Beans / Post-emergent	Registered in green beans for control of Prince of Wales Feather. Registered for control of **Pigweed** in soybeans, peanuts, mung beans and adzuki beans.	28	P-A	ALL	-

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 a range of grass and broadleaf weeds, including **Pigweed** in silverbeet.		P		-
Fluroxypyr (Starane)	I**		Registered for control of broadleaf weeds, including **Pigweed** in broadacre crops.		P		-
Norflurazon (Zoliar) Agnova	F**		Registered for control of grass and broadleaf weeds including **Pigweed** in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Annual Ryegrass (*Lolium rigidum*) **Priority: Moderate**							
Annual Ryegrass was ranked as a moderate priority in TAS. Populations of Annual Ryegrass are prone to herbicide resistance so integrated weed management and rotation of herbicide modes of action are important aspects of a long-term control strategy.							
Chlorthal-Dimethyl (Dacthal)	D**	Beans / Pre-emergent	Registered in beans for control of various grass and broadleaf weeds including **Annual Ryegrass**. Spray at transplanting.	NR	A	ALL	-
Dimethenamid-P (Outlook) BASF	K**	Green beans / residual / Pre-emergent	Registered in beans for control of broadleaf weeds including suppression of **Annual Ryegrass**. Irrigation or rain is required within 7 days of application. [Max no. of applications and re-treatment interval not specified]	NR G:28	A	ALL	-
Fluazifop-P (Fusilade)	A***	Beans / Post emergent grass selective	Registered in beans for control of grass weeds, including **Annual Ryegrass**. [Max no. of applications and re-treatment interval not specified]	35 G:35	A	ALL	-
Glufosinate-Ammonium (Basta)	N**	Green bean / Post-emergent	Registered in green bean for control of grass and broadleaf weeds including **Annual Rye Grass**. Apply with an inter-row shielded sprayer. [Max. 1 application per season]	28	A	ALL	R3
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Annual Ryegrass**, as a pre-crop spray.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Annual Ryegrass**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Quizalofop-P-Ethyl	A***	Beans / Post emergent / Grass selective	Registered in beans for control of grass weeds, including **Annual Ryegrass**. Apply when weeds are actively growing. [Max no of applications not specified]	35 G:28	A	ALL	R3
Sethoxydim (Sertin)	A***	Green Beans / Post-emergent	Registered in green beans for control of grass weeds, including **Annual Ryegrass**. Apply when weeds are actively growing. [Max no of applications not specified]	42 G:21	A	ALL	-
Trifluralin	D**	Green Beans / Pre-emergent	Registered in green beans for control of grass and broadleaf weeds, including **Annual Ryegrass**. Must be incorporated by cultivation within 4 hours of application.	NR	A	ALL	-
S-Metolachlor (Dual Gold) Syngenta	K**	Green beans / Pre-emergent	Registered in green bean for control of grass and broadleaf weeds. Registered for control of **Annual Ryegrass** in brassica vegetables.	56 G:70	P-A	ALL (excl. WA)	-
Imazamox (Raptor) BASF	B***		Permitted for use in Faba beans for control of broadleaf weeds, including **Annual Ryegrass**.		P		-
Imazethapyr (Spinnaker) BASF	B***		Registered in Faba beans for control of grass and broadleaf weeds, including **Annual Ryegrass**.		P		-
S-Metolachlor+ Prosulfocarb (Boxer Gold) Syngenta	J+K**		Registered in potatoes for control of **Annual Ryegrass**.		P		-
Norflurazon (Zoliar) Agnova	F**		Registered in asparagus, citrus, grapes, nuts, stone & pome fruits for control of grass and broadleaf weeds including **Annual Ryegrass**.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Blackberry Nightshade (*Solanum nigrum*) **Priority: Moderate**							
Blackberry Nightshade was ranked as a moderate priority in VIC. Prolific weed that is widely adapted and difficult to eradicate, mainly due to its long-term seed viability.							
Bentazone (Basagran)	C**	Green beans (French Dwarf) / Selective post-emergent	Registered in green beans for control of broadleaf weeds including **Blackberry Nightshade**. [Max no. of applications and re-treatment interval not specified]	35	A	ALL	-
Chlorthal-Dimethyl (Dacthal)	D**	Beans / Pre-emergent	Registered in beans for control of various grass and broadleaf weeds including **Blackberry Nightshade**. Spray at transplanting.	NR	A	ALL	-
Clomazone	Q**	Green beans / Pre-emergent residual	Registered in beans for control of broadleaf weeds, including **Blackberry Nightshade**. [Max 3 applications per crop; re-treatment interval not specified]	NR	A	ALL	-
Dimethenamid-P (Outlook) BASF	K**	Green beans / residual / Pre-emergent	Registered in beans for control of broadleaf weeds including **Blackberry Nightshade**. Irrigation or rain is required within 7 days of application. [Max no. of applications and re-treatment interval not specified]	NR G:28	A	ALL	-
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Blackberry Nightshade**, as a pre-crop spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Blackberry Nightshade**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	D**	French Beans / Pre-Emergent	Registered in French beans for control of grass and broadleaf weeds, including suppression of **Blackberry Nightshade**. Do not apply to crops sown during autumn, winter or early spring.	NR	A	QLD, TAS	-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	K**	Green beans / Pre-emergent	Registered in green bean for control of grass and broadleaf weeds, including **Blackberry Nightshade**. Irrigation or rain is required within 10 days of application. [Max. 1 application per season]	56 G:70	A	ALL (excl. WA)	-
Acifluorfen (Blazer)	G**	Green Beans / Post-emergent	Registered in green beans for control of Prince of Wales Feather. Registered for control of **Blackberry Nightshade** in soybeans, peanuts, mung beans and adzuki beans.	28	P-A	ALL	-
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. **Blackberry Nightshade** is listed as moderately susceptible at a high rate.		P		-
Norflurazon (Zoliar) Agnova	F**		Registered in asparagus, citrus, grapes, nuts, stone & pome fruits for control of grass and broadleaf weeds including **Blackberry Nightshade**.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Common Thornapple (*Datura stramonium*) **Priority: Moderate**							
Common Thornapple was ranked as a moderate priority in QLD.							
Bentazone (Basagran)	C**	Green beans (French Dwarf) / Selective post-emergent	Registered in green beans for control of broadleaf weeds including **Common Thornapple**. [Max no. of applications and re-treatment interval not specified]	35	A	ALL	-
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Common Thornapple**, as a pre-crop spray.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat + Diquat (SpraySeed)	L***	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Common Thornapple**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Acifluorfen (Blazer)	G**	Green Beans / Post-emergent	Registered in green beans for control of Prince of Wales Feather. Registered for control of **Common Thornapple** in soybeans, peanuts, mung beans and adzuki beans.	28	P-A	ALL	-
Fluroxypyr (Starane)	I**		Registered for control of broadleaf weeds, including **Common Thornapple** in broadacre crops.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Phenmedipham (Betanal) Bayer	C**		Registered for control of grass and broadleaf weeds, including **Common Thornapple** in silverbeet.		P		R3
Volunteer Potato (*Solanum tuberosum*) **Priority: Moderate**							
Volunteer Potato was ranked as a moderate priority in TAS.							
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Volunteer Potato**, as a pre-crop spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Volunteer Potato**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Fluroxypyr (Starane)	I**		Registered for control of broadleaf weeds, including **Volunteer Potato** in poppies.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Oxyfluorfen (Goal)	G**		Registered for control of grass and broadleaf weeds, including **Volunteer Potato** in pyrethrum. Compatible with glyphosate and diquat/paraquat.		P		-
Marshmallow (*Malva parviflora*) **Priority: Low**							
Marshmallow was ranked as a low priority in QLD. Adapted to a wide variety of environments and highly competitive weed. Control with knockdown herbicides can be unreliable.							
Glyphosate (Roundup)	M**	General knockdown. Pre-crop spray	Registered for control of grass and broadleaf weeds, including **Marshmallow**, as a pre-crop spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	L**	Field beans / General seed bed preparation / Post-emergent inter-row weed control	Registered in beans and vegetables as a pre-crop spray for control of grass and broadleaf weeds, including **Marshmallow**. For use in field grown crops only. Apply as a post-emergence directed or shielded spray, ensuring that the spray does not contact the crop. [Max no of applications not specified]	NR G:7	A	ALL	R3
Chloridazon (Pyramin) BASF	C**		Registered in silverbeet for control of a range of grass and broadleaf weeds, including **Marshmallow**.		P		-
NUL3438 Nufarm	TBC		New active in development, Nufarm claims activity on broadleaf weeds.		P		-
Oxyfluorfen (Goal)	G**		Registered for control of grass and broadleaf weeds, including **Marshmallow** in fallow situations. Compatible with glyphosate and diquat/paraquat.		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/F2020C00713
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 2018-19	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 green beans
Appendix 2. Products available for control of insects and mites in green beans
Appendix 3. Products available for weed control in green beans
Appendix 4. Current permits for use in green beans
Appendix 5. Green Beans Maximum Residue Limits (MRLs)
Appendix 6. Green Beans Agrichemical Regulatory Risk Assessment

Appendix 1. Products available for disease control in green beans

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
1,3-Dichloropropene + Chloropicrin (Telone C-35)	8B	Vegetables / General Fumigant	Soil borne fungi	ALL	NR	-
Azoxystrobin (Amistar)	11	Beans	Sclerotinia Rot (suppression only)	ALL	NR	-
Bacillus amyloliquefaciens (Serenade Opti Biofungicide) PER87630	BM 02	Green Beans	Suppression only of: Bacterial Spot / Blight (*Xanthomonas* spp.)	ALL (excl. VIC)	NR	-
Bitertanol (Baycor) Bayer	3	Beans	Rust	ALL	3	
Boscalid (Filan) BASF	7	Legume Vegetables (field)	Sclerotinia Rot	ALL	7	-
Chloropicrin (Agrocelhone NE Soil Fumigant)	8	Vegetables / General Fumigant	Soil borne fungi	ALL	NR	-
Copper Hydroxide	M1	Beans	Common Blight (*Xanthomonas campestris pv. Phaseoli)*, Halo Blight (*Pseudomonas syringae pv. Phaseasiolicola*) and Bacterial Brown Spot (*Pseudomonas syringae pv. Syringae*).	ALL	1	-
Copper Ammonium Acetate	M1	Beans	*Botrytis* spp., Rust, Bacterial Blight and Halo Blight	ALL	1	-
Cyprodinil + Fludioxonil (Switch) Syngenta	9+12	Green Beans	Grey Mould, Sclerotinia	ALL	7 NG	R3
Dazomet (Basamid, Cerlong)	8F	General Soil Fumigant	Insects, weeds & soil fungi	ALL	NR	-

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Iprodione (Rovral) PER84955	2	Green Beans	Sclerotinia Rot	ALL (excl. VIC)	7	R2
Mancozeb	M3	Green Beans	Rust and Cercospora Leaf Spot and suppression of Chocolate Spot and Ascochyta Leaf Blight.	ALL	7 G:7	R2
Mancozeb PER14593	M3	Specified Legume Vegetables	Downy Mildew Anthracnose Alternaria	ALL (excl. VIC)	7 G:14	R2
Mandestrobin (Intuity) Sumitomo	11	Green Beans	Sclerotinia White Mould	ALL	7	-
Metiram (Polyram) BASF	M3	Beans	Rust, Anthracnose	ALL	7	R2
Oxycarboxin (Plantvax) UPL	7	Green Beans	Rust	ALL	7	-
Quintozene (Terraclor)	14	Beans	Stem Rot, Root Rot (*Rhizoctonia*)	ALL	28	-
Sulphur	UN	Vegetables	Powdery Mildew and Rust	ALL	NR	-
Tebuconazole	3	Green Beans	Rust	ALL	3	R3
Thiram	M3	Beans	Damping Off	QLD	7	R2
Zineb	M3	Beans	Rust, Anthracnose	ALL	7	R2

Appendix 2. Products available for control of insects and mites in green beans

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Abamectin PER81876	6	Legume vegetables	Leafminers (*Liriomyza* spp.) Suppression only Including Vegetable Leafminer (Liriomyza sativae) and Serpentine Leafminer (Liriomyza huidobrensis)	ALL (excl. VIC)	7 NG	-
Alpha pinene, Anisyl alcohol, Butyl salicylate, cineole, D-limonene & Phenylacetaldehyde (Magnet) AgBiTech	-	Green beans	Helicoverpa (Cotton bollworm and Native budworm)	ALL	Variable Refer to label	-
Bacillus thuringiensis subsp. *kurstaki* (DiPel)	11A	Vegetables	Armyworm, Cotton Bollworm, Native Budworm, Cabbage Moth, Cabbage White Butterfly, Green Looper, Lightbrown Apple Moth, Pear Looper, Soybean Looper, Vine Moth, and Tobacco Looper.	ALL	NR	-
Beauveria bassiana (Velifer) BASF	UN	Protected vegetables and ornamentals	Suppression of various pests including: Western Flower Thrips, Onion Thrips, Greenhouse Whitefly, Silverleaf Whitefly, Sweet Potato Whitefly, Green Peach Aphid & Two-Spotted Spider Mites.	ALL	NR	-
Bifenthrin (Astral)	3A	Beans (common – fresh and processing)	Silverleaf Whitefly	ALL	14 G:14	-
			Redlegged Earth Mite		NR	
Chlorantraniliprole (Coragen) FMC	28	Green beans	Cotton Bollworm and Native Budworm	ALL	1	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Chlorantraniliprole (Coragen) FMC PER89259	28	Legume Vegetables	Fall Armyworm	ALL (excl. VIC)	1	-
Chlorantraniliprole + Thiamethoxam (Durivo) Syngenta PER87051	28+4A	Green Beans	Diamondback Moth (*Plutella xylostella*), Cabbage White Butterfly (*Pieris rapae*), Corn Earworm (*Helicoverpa armigera*), Native Budworm (*Helicoverpa punctigera*), Cabbage Centre Grub (*Hellula hydralis*), Cabbage Cluster Caterpillar (*Crocidolomia pavonana*), Cluster Caterpillar (*Spodoptera litura*), Soybean Looper (*Thysanoplusia orichalcea*), Cabbage Aphid (*Brevicoryne brassicae*), Green Peach Aphid (*Myzus persicae*), Silverleaf Whitefly (*Bemisia tabaci*,), Greenhouse Whitefly (*Trialeurodes vaporariorum*), Green Vegetable Bug (*Nezara viridula*), Western Flower Thrips (*Frankliniella occidentalis*), Onion Thrips (*Thrips tabaci*), Potato Moth (*Phthorimaea operculella*), Tomato Thrips (*Frankliniella schultzei*), Brown Sowthistle Aphid (*Uroleucon sonchi*), Vegetable Leaf Hopper (*Austroasca viridigrisea*), Lucerne Leafroller (*Merophyas divulsana*), Leafhoppers / Jassids (*Cicadellidae*), Psyllids (*Psyllidae*)	QLD growers in Wide Bay Burnett region ONLY	42 NG	R2
Chlorpyrifos (Lorsban) PER14583	1B	Beans	African Black Beetle False Wireworm Wireworm	ALL (excl. VIC)	NR	R1
Cyantraniliprole (Benevia) FMC PER90652	28	Green Beans	Silverleaf Whitefly	ALL	1	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Cyromazine (Diptex 150WP) PER81867	17	Legume Vegetables	Liriomyza spp.	ALL	7	-
Dimethoate	1B	Green Vegetable Beans	Aphids, Thrips, Leafhoppers, Jassids, Mites, Green Vegetable Bug, and Wingless Grasshopper	ALL	7 G:7	R1
Emamectin (Proclaim Opti) Syngenta	6	Legume vegetables including Green beans	Helicoverpa (Cotton Bollworm and Native Budworm)	ALL	3 G:21	-
Emamectin (Proclaim Opti) Syngenta PER89263	6	Legume vegetables (field & protected)	Fall Armyworm (*Spodoptera frugiperda*)	ALL (excl. VIC)	3	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Vegetables	Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and Leafhoppers. Suitable for organic growers.	ALL	1	-
Imidacloprid (Confidor) PER85103	4A	Green beans (field)	Silverleaf Whitefly	QLD	NR G:42	R2
Maldison	1B	Beans (all types)	Aphids, Cabbage Moth, Cabbage White Butterfly, Green Vegetable Bug, Jassids, Leafhoppers, Rutherglen Bug & Thrips (beans)	SA, NSW, VIC, TAS, WA, NT	3	-
Methomyl (Lannate) PER82428	1A	Legume vegetables (field)	Helicoverpa spp. Cucumber Moth, Cluster Caterpillar Loopers, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips.	ALL	3	R2
Methomyl (Lannate) PER89293	1A	Beans (field)	Fall Armyworm	ALL	1	R2
Paraffinic Oil	-	Beans (all types)	Aphid, Mites, Thrips and Leafhoppers.	ALL (excl. QLD)	1	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Permethrin	3A	Green beans	Helicoverpa punctigera, Helicoverpa armigera	Variable refer to label	Variable refer to label	-
Pirimicarb (Aphidex) Adama	1A	Beans (all types)	Cowpea Aphid	VIC, TAS, WA	2	R3
Potassium Salts of Fatty Acids (Natrasoap)	3A	Vegetables	Aphids, Thrips, Mealybug, Two Spotted Mites, Spider Mite, and Whitefly	ALL	NR	-
Propargite (Omite)	12C	Vegetables	Spider Mite (QLD and WA only) and Two Spotted Mites	ALL	7	R3
Pyrethrins (Pyganic) Sumitomo PER86551	3A	Beans (field & protected)	Bean Pod Borer	ALL	1 G:1	-
Pyrethrins + Piperonyl Butoxide	3A	Vegetables	Ants, Aphids, Thrips, Caterpillars, Leafhoppers, and Whitefly	ALL	1	-
Pyriproxyfen (Admiral) Sumitomo PER84890	7C	Beans (field)	Silverleaf Whitefly	ALL (excl. VIC)	1 NG	-
Spinetoram (Success Neo) Corteva	5A	Legume Vegetables	Caterpillars (Heliothis and Loopers) and Western Flower Thrips	ALL	3	-
Spinetoram (Success Neo) Corteva PER89241	5	Legume Vegetables (field & protected)	Fall Armyworm (*Spodoptera frugiperda*)	ALL (excl. VIC)	1	-
Spinetoram (Success Neo) Corteva PER87878	5	Green Beans (field & protected)	Liriomyza Leafminers (*Liriomyza* spp.)	ALL (excl. VIC)	3 G:14	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Spinosad (Entrust Organic) Corteva	5	Legume Vegetables	Loopers, Helicoverpa & Western Flower Thrips	ALL	3 G:14	-
Spinosad (Entrust Organic) Corteva PER89870	5	Legume Vegetables / (succulent seeds & immature pods) (field & protected)	Fall Armyworm (*Spodoptera Frugiperda*)	ALL (excl. VIC)	3 G:14	-
Spinosad (Entrust Organic) Corteva PER90928	5	Legume Vegetables (field & protected)	Vegetable Leaf Miner (*Liriomyza sativae*) Pea Leaf Miner / Serpentine Leaf Miner (*Liriomyza huidobrensis*) American Serpentine Leaf Miner (*Liriomyza trifolii*)	ALL (excl. VIC)	3 G:14	-
Spirotetramat (Movento) Bayer	23	Green Beans	Western Flower Thrips, Tomato Thrips, Green Peach Aphid & Silverleaf Whitefly	ALL	7	-
Spirotetramat (Movento) Bayer PER88640	23	Green Beans (field)	Liriomyza Leafminers (*Liriomyza* spp.)	ALL (excl. VIC)	7 G:7	-
Spodoptera frugiperda Multiple Nucleopolyhedrovirus (Fawligen) AgBiTech PER90820	31	Legume Vegetables	Fall Armyworm (*Spodoptera frugiperda*)	ALL	NR	-
Sulphur	UN	Vegetables	Mites	ALL	NR	-
Trichlorfon (Lepidex)	1B	Vegetables, including beans	Cutworm, Vegetable Bug, Rutherglen Bug	Variable refer to label	2	R2

Appendix 3. Products available for weed control in green beans

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Acifluorfen (Blazer)	G**	Green beans / Post-emergent	Prince of Wales Feather (*Amaranthus powellii*)	28	ALL	-
Bentazone (Basagran)	C**	Green beans (dwarf French) / Post-emergent	Broadleaf weeds	35	ALL	-
Chlorthal-Dimethyl (Dacthal)	D**	Beans / Pre-emergent	Grass and broadleaf weeds	NR	ALL	-
Clomazone	Q**	Green beans / Pre-emergent	Broadleaf weeds	NR	ALL	-
Dimethenamid-P (Outlook) BASF	K**	Green beans / Pre-emergent	Broadleaf weeds	NR G:28	ALL	-
Fluazifop-P (Fusilade)	A***	Beans / Post-emergent	Grass weeds	35 G:35	ALL	-
Glufosinate-Ammonium (Basta)	N**	Green bean (field use only) / Post-emergent	Grass and broadleaf weeds as a pre-crop spray	28	ALL	R3
Glyphosate (Roundup)	M**	General knockdown / Vegetables	Grass and broadleaf weeds as a pre-crop spray	NR	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	K**	Green beans / Pre-emergent	Grass and broadleaf weeds	56 G:70	ALL (excl. WA)	-
Paraquat + Diquat (SpraySeed)	L**	Field beans / Seed bed preparation / Post-emergent inter-row weed control	Grass and broadleaf weeds	NR G:7	ALL	R3

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Pendimethalin (Stomp)	D**	French Beans / Pre-Emergent	Grass and Broadleaf Weeds	NR	QLD, TAS	-
Quizalofop-P-Ethyl	A***	Beans / Post-emergent	Grass weeds	35 G:28	ALL	R3
Sethoxydim (Sertin)	A***	Green Beans / Post-emergent	Grass Weeds	42 G:21	ALL	-
Trifluralin	D**	Beans / Pre-emergent	Grass and broadleaf weeds	NR	ALL	-

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

Appendix 4. Current permits for use in beans

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER81876 Version 4	Abamectin / Various including Legume Vegetables / Leafminers (*Liriomyza* spp.)	24-Jun-16	30-Apr-24	Hort Innovation
PER87630	Bacillus amyloliquefaciens (Serenade Opti Biofungicide) / Brassica vegetables, Brassica leafy vegetables, Lettuce, and Green beans / Bacterial spot/Blight (Xanthomonas spp.) Suppression only (Field and protected)	18-Jun-19	30-Jun-22	Hort Innovation
PER89259	Chlorantraniliprole (Coragen) / Various Crops including Legume Vegetables / Fall Armyworm (field)	06-Mar-20	31-Mar-23	Hort Innovation
PER87051	Chlorantraniliprole + Thiamethoxam (Durivo) /Various crops including Green Beans (field only)/ Various Insect Pests (QLD growers in Wide Bay Burnett region ONLY)	25-Feb-19	28-Feb-24	Bundaberg Fruit and Vegetable Growers Cooperative
PER14583 Version 4	Chlorpyrifos (Lorsban) / Various Vegetable Crops including Beans / African black beetle, False wireworms & Wireworms (field only)	01-Apr-14	31-Oct-21	Hort Innovation
PER81867 Version 2	Cyromazine (Diptex 150WP) / Legume Vegetables / Leafminers (Liriomyza spp.)	02-Dec-19	30-Nov-23	Hort Innovation
PER89263	Emamectin (Proclaim Opti) / Various Crops including Legume Vegetables/ Fall Armyworm (field & protected)	10-Mar-20	31-Mar-23	Hort Innovation
PER85103 Version 2	Imidacloprid (Nuprid) / Green beans / Silverleaf Whitefly (QLD) (field only)	12-Sep-17	30-Sep-22	Hort Innovation
PER84955	Iprodione (Rovral) / Green bean / Sclerotinia (field only)	12-Feb-18	28-Feb-23	Hort Innovation
PER14593 Version 2	Mancozeb / Specified fruiting and legume vegetables (Edamame, Flower bean, Green soybean, Hanamame, Snake bean, Winged bean and Yard long bean / Downy Mildew, Anthracnose & Alternaria	10-Jul-14	31-Apr-25	Hort Innovation

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER82428 Version 4	Methomyl (Lannate) / Legum vegetables / *Helicoverpa* spp., Cucumber moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen bug, Thrips including Western Flower Thrips (field only)	22-Apr-16	31-Mar-24	Hort Innovation
PER89293	Methomyl (Lannate) / Various Crops including Legume Vegetables / Fall Armyworm	10-Apr-20	30-Apr-23	Hort Innovation
PER86551	Pyrethrin (Pyganic) / Organic Green beans / Bean podborer	15-Apr-19	30-Apr-24	Hort Innovation
PER84890 Version 2	Pyriproxyfen (Admiral) / Green Beans / Silverleaf Whitefly (field)	15-May-18	31-Mar-23	Hort Innovation
PER89241	Spinetoram (Success Neo and Delegate Insecticide) / Various Crops including Legume Vegetables / Fall Armyworm	06-Mar-20	31-Mar-23	Hort Innovation
PER87878 Version 2	Spinetoram (Success Neo) / Snow peas, Sugar snap peas & Green Beans / Leafminers (*Liriomyza* spp.)	11-Feb-20	28-Feb-23	Hort Innovation
PER89870	Spinosad (Entrust Organic) / Various Crops including Legume Vegetables / Fall Armyworm (field & protected)	21-Jul-20	31-Jul-23	Hort Innovation
PER90928	Spinosad (Entrust Organic) / Various, including Legume Vegetables / Leafminers (field & protected)	23-Apr-21	30-Apr-24	Hort Innovation
PER88640	Spirotetramat (Movento 240 SC) / Green Beans / Leafminers (*Liriomyza* spp.) (field)	18-May-20	31-May-23	Hort innovation
PER90820	Spodoptera Frugiperda Multiple Nucleopolyhedrovirus (SfMNPV) (Fawligen Fall Armyworm Biocontrol) / Various Crops including Legume Vegetables / Fall Armyworm	30-Mar-21	31-Mar-24	Agri-Science QLD

Appendix 5. Green Bean Maximum Residue Limits (MRLs)

CODEX/APVMA commodity groupings of Beans and subgroups:
VP 0060 Legume vegetables (all commodities in Group 14)
VP 2060 Beans with pods (all commodities in subgroup 014A)
VP 0526 Common bean (pods and/or immature succulent seeds)
VP 0061 Beans with pods (Beans-shelled)

Note: Major export market for beans is New Zealand with a very small portion destined for Canada and other countries. Available information indicates that in the absence specific limits in legislation the most countries defers 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
1,3-dichloropropene		Soil fumigant / MRLs not required	NR	
2,4-D	VP0060	Legume vegetables	*0.05	-
Abamectin	VP0061	Beans, except broad bean and soya bean	-	0.08
	VP0060	Legume vegetables {except Peas (pods and succulent = immature seeds)}	T0.1	
Acephate	VP0061	Beans, except broad bean and soya bean	-	5
Acetamiprid	VP0061	Beans, except broad bean and soya bean	-	0.4
Acetochlor	VP0061	Beans, except broad bean and soya bean	-	0.02*
Acifluorfen	VP0060	Legume vegetables	0.1	-
Aldrin and Dieldrin	VP0060	Legume vegetables	-	0.05E
Azoxystrobin	VP0060	Legume vegetables	3	3
Bifenazate	VP0060	Legume vegetables	-	7
	VP0544	Yard-long bean (pods)	T1	
Bentazone	VP0061	Beans, except broad bean and soya bean	*0.1	0.01*
Bifenthrin	VP0526	Common beans (pods and/or immature seeds)	0.7	-
Bitertanol	VP0061	Beans, except broad bean and soya bean	0.5	-
Boscalid	VP0060	Legume vegetables	3	3
Bromopropylate	VP 0526	Common beans (pods and/or immature seeds)	-	3
Butroxydim	VP0060	Legume vegetables	*0.01	-
Carbendazim	VP0526	Common beans (pods and/or immature seeds)	-	0.5
Chlorantraniliprole	VP0061	Beans, except broad bean and soya bean	-	0.8
	VP0060	Legume vegetables	1	-
Chloropicrin			NA	NA
Chlorothalonil		Vegetables (some exceptions)	T7	
Chlorpyrifos	VP0526	Common beans (pods and/or immature seeds)	-	0.01
		Vegetables	T*0.01	
Chlorthal-Dimethyl		Vegetables except lettuce	5	
Clethodim (refer to Sethoxydim)	VP0061	Beans, except broad bean and soya bean	T0.5	0.5*
Clomazone	VP0061	Beans, except broad bean and soya bean	*0.05	-
	VP0526	Common bean (pods and/or immature seeds)	T*0.05	
Clothianidin	VP0060	Legume vegetables	-	0.01*
	VP0061	Beans, except broad bean and soya bean	-	0.2
	VP0526	Common beans (pod and/or immature seeds)	T*0.05	

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Cyantraniliprole	VP0526	Common beans (pod and/or immature seeds)	T1	1.5
Cyazofamid	VP0061	Beans, except broad bean and soya bean	-	0.4
Cycloxydim	VP0061	Beans, except broad bean and soya bean	-	15
Cyfluthrin	VP0060	Legume vegetables	0.5	-
Cyhalothrin (includes lambda-cyhalothrin)	VP0060	Legume vegetables	0.1	0.2
Cypermethrins (including alpha- and zeta-cypermethrin)	VP0060	Legume vegetables	-	0.7
Cyprodinil	VP0526	Common beans (pod and/or immature seeds)	0.7	-
Cyromazine	VP0060	Legume vegetables	T1	
Dazomet		Soil fumigant / MRLs not required	NR	
Deltamethrin	VP0060	Legume vegetables	0.1	0.2
Diazinon	VP0526	Common beans (pods and/or immature seeds)	-	0.2
Difenoconazole	VP0061	Beans, except broad bean and soya bean	-	0.7
Diquat	VP0061	Beans, except broad bean and soya bean	1	-
Dimethenamid-P	VP0526	Common beans	*0.02	-
Dimethoate (see also Omethoate)	VP0060	Legume vegetables	T2	-
Diquat	VP0061	Beans, except broad bean and soya bean	1	
		Vegetables	*0.05	
Disulfoton	VP0526	Common beans (pods and/or immature seeds)	-	0.2
Dithiocarbamate (mancozeb, metham, metiram, thiram, zineb and ziram)	VP0526	Common beans (pod and/or immature seeds)	2	-
	VP0061	Beans, except broad bean and soya bean	2	-
Emamectin	VP0060	Legume vegetables	0.1	0.01
Fenamidone	VP0061	Beans, except broad bean and soya bean	-	0.8
Fenpyroximate	VP0526	Common beans (pods and/or immature seeds)	-	0.4
Fenvalerate	VP0060	Legume vegetables	0.5	-
Fluazifop-p-butyl	VP0060	Legume vegetables	0.1	-
Flubendiamide	VP0060	Legume vegetables	-	2
	VP0526	Common beans (pods and/or immature seeds)	T2	-
Fludioxonil	VP0061	Beans, except broad bean and soya bean	-	0.6
	VP0526	Common beans (pod and/or immature seeds)	0.7	-
Fluopyram	VP0061	Beans, except broad bean and soya bean	-	1
Fluxapyroxad	VP0061	Beans, except broad bean and soya bean	-	2
Glufosinate-Ammonium	VP0526	Common beans (pods and/or immature seeds)	T*0.05	0.05*
Glyphosate	VP0060	Legume vegetables	*0.1	-
Haloxyfop	VP0061	Beans, except broad bean and soya bean	-	0.5
Imazamox	VP0061	Beans, except broad bean and soya bean	-	0.05*
Imazethapyr	VP0060	Legume vegetables	*0.1	-
Imidacloprid	VP0061	Beans, except broad bean and soya bean	-	2
	VP0526	Common beans (pods and/or immature seeds)	T1	

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Iprodione	VP0526	Common beans (pods and/or immature seeds)	-	2
	VP0061	Beans, except broad bean and soya bean	T2	-
Iron-EDTA		MRLs not required	NR	
Malathion	VP0061	Beans, except broad bean and soya bean	-	1
Maldison	VP0060	Legume vegetables	2	-
Mancozeb	VP0061	Beans, except broad bean and soya bean	2	
Mandestrobin	VP0061	Beans, except broad bean and soya bean	0.7	
MCPB	VP0060	Legume vegetables	*0.02	-
Metaldehyde		Vegetables	1	
Methiocarb		Vegetables	0.1	
Metiram	VP0061	Beans, except broad bean and soya bean	2	
Metolachlor	VP0061	Beans, except broad bean and soya bean	*0.02	-
Methamidophos	VP0061	Beans, except broad bean and soya bean	-	1
Methomyl (see also Thiodicarb)	VP0061	Beans, except broad bean and soya bean	-	1
	VP0060	Legume vegetables	1	-
	VP0526	Common beans (pods and/or immature seeds)	-	1
Methoxyfenozide	VP0526	Common beans (pods and/or immature seeds)	-	2
Myclobutanil	VP0061	Beans, except broad bean and soya bean	-	0.8
Novaluron	VP0526	Common beans (pods and/or immature seeds)	-	0.7
Omethoate	VP0060	Legume vegetables	1	
Oxycarboxin	VP0061	Beans, except broad bean and soya bean	5	-
Paraffinic oil		MRLs not required	NR	
Paraquat		Vegetables (some exceptions)	*0.05	
Pendimethalin	VP0060	Legume vegetables	T0.2	-
Penthiopyrad	VP0061	Beans, except broad bean and soya bean	-	3
Permethrin	VP0526	Common beans (pods and/or immature seeds)	0.5	1
Phorate	VP0526	Common beans (pods and/or immature seeds)	-	0.05*
Phosphine	VP0060	Legume vegetables	T*0.01	-
Piperonyl butoxide		Vegetables	8	
Pirimicarb	VP0060	Legume vegetables	-	0.7
Potassium salts of fatty acids		MRLs not required	NR	
Procymidone	VP0526	Common beans (pods and/or immature seeds)	T3	-
Propargite		Vegetables	3	
Pydiflumetofen	VP0060	Legume vegetables	T0.5	
Pyrethrins		Vegetables	1	
Pyrimethanil	VP0526	Common beans (pods and/or immature seeds)	-	3
Pyriproxyfen	VP2060	Beans with pods	T0.3	-
Quintozene	VP0526	Common beans (pods and/or immature seeds)	-	0.1
	VP0061	Beans, except broad bean and soya bean	0.01	
Quizalofop-ethyl	VP0526	Common beans (pods and/or immature seeds)	*0.02	-
Quizalofop-P-tefuryl	VP0526	Common beans (pods and/or immature seeds)	*0.02	-
Rotenone		MRLs not required	NR	
Saflufenacil	VP0060	Legume vegetables	*0.03	-
Spinetoram	VP0061	Beans, except broad bean and soya bean	-	0.05
	VP0060	Legume vegetables	0.2	-
Spinosad	VP0060	Legume vegetables	0.2	0.3
	VP0061	Beans, except broad bean and soya bean	0.5	-

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Spirotetramat	VP0060	Legume vegetables	2	1.5
Sulphur		MRLs not required	NR	
Tebuconazole	VP0060	Legume vegetables	0.5	-
Thiamethoxam (see also Clothianidin)	VP0060	Legume vegetables	-	0.01*
	VP0061	Beans, except broad bean and soya bean	T0.2	0.3
Thiram	VP0061	Beans, except broad bean and soya bean	2	
Triallate	VP0060	Legume vegetables	*0.05	-
Trichlorfon		Vegetables (some exceptions)	0.1	
Zineb	VP0061	Beans, except broad bean and soya bean	2	

NOTE: MRLs are constantly under review and subject to change. Check for current MRLs and do not rely on the values stated above. VP0060 and VP0061 MRLs of Table 1 will be revised soon to align with CODEX crop groupings.

* Indicates that an MRL is at the Limit of Quantitation (LOQ)
NR - Uses of substances where MRLs are not necessary / required.
NA – MRLs are not in place.
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 15 January 2020. CODEX MRLs: CODEX Alimentarius International Food Standards database (February 2020), http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/

Appendix 6. Green Bean Agrichemical Regulatory Risk Assessment

Green bean Agrichemical Regulatory Risk Assessment

July 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 green beans as well as current initiatives aimed at addressing identified pest management deficiencies.

Green bean 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	Actions
INSECT AND MITE PESTS				
Aphids				
Aphids	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	ST17000 Data generation for a label registration Afidopyropen (Versys)
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Paraffinic oil			
	Petroleum oil			
Cowpea aphid	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Pirimicarb	**1A**	Codex: JMPR Periodic re-evaluation 2022/23 EU: Candidate for substitution	
Green peach aphid	Spirotetramat	**23**		
	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	

Problem	Active Constituents	Chemical Group	Comment	Actions
Beetles				
African black beetle	Chlorpyrifos	**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: Cancellation of use USA:EPA decision to allow continued use	
Spotted vegetable weevil	Chlorpyrifos			
Vegetable weevil	Chlorpyrifos			
28-spotted potato ladybird	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
Caterpillars/Lepidoptera				
Armyworms	*B thuringiensis*	**11A**		
Australian cabbage looper	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
Bean flower caterpillar	Diazinon	**1B**	EU: Deregistered Codex: To be reviewed.	
Bean podborer	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Pyrethrins (PER86551)	**3A**		
Cabbage white butterfly	*B thuringiensis*	**11A**		
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
Caterpillars	*B thuringiensis*	**11A**		
	Spinetoram	**5**		

Problem	Active Constituents	Chemical Group	Comment	Actions
Cluster caterpillar	Emamectin benzoate	**6**	EU: Candidate for substitution	
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
Corn earworm / Cotton bollworm (*Helicoverpa armigera*) Native budworm / Bollworm (*Helicoverpa punctigera*)	*B thuringiensis*	**11A**		
	Chlorantraniliprole	**28**		
	Deltamethrin	**3A**		
	Emamectin benzoate	**6**	EU: Candidate for substitution	
	Esfenvalerate	**3A**	EU: Candidate for substitution	
	Helicoverpa NPV (armigera)(zea)	**31**		
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Permethrin 40:60	**3A**	Codex: Re-evaluation scheduled 2021/22. Support uncertain EU: No authorisation	
	Spinetoram	**5**		
	Spinosad	**5**		
	Thiodicarb	**1A**	EU: No authorisation	
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	

Problem	Active Constituents	Chemical Group	Comment	Actions
Corn earworm / Cotton bollworm	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
Fall armyworm	Chlorantraniliprole (PER89259)	**28**		
	Emamectin benzoate (PER89263)	**6**	EU: Candidate for substitution	
	Methomyl (PER89293)	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Spinetoram (PER89241)	**5**		
	Spinosad (PER89870)	**5**		
Green looper	*B thuringiensis*	**11A**		
Looper caterpillars	Deltamethrin	**3A**		
	Emamectin benzoate	**6**	EU: Candidate for substitution	
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Spinetoram	**5**		
	Spinosad	**5**		

Problem	Active Constituents	Chemical Group	Comment	Actions
Soybean looper	*B thuringiensis*	**11A**		
	Emamectin benzoate	**6**	EU: Candidate for substitution	
	Spinetoram	**5**		
	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
Tobacco budworm	Permethrin 40:60	**3A**	Codex: Re-evaluation scheduled 2021/22. Support uncertain EU: No authorisation	
Tobacco looper	*B thuringiensis*	**11A**		
Turnip moth	Deltamethrin	**3A**		
	Lambda-cyhalothrin	**3A**	EU: Candidate for substitution	
Webworms	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	

Problem	Active Constituents	Chemical Group	Comment	Actions
Flies				
Bean fly	Diazinon	**1B**	EU: Deregistered Codex: To be reviewed by 2020/21.	
	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
Grasshoppers/Locusts				
Australian plague locust Migratory locust	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Chlorpyrifos	**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: Cancellation of use USA:EPA decision to allow continued use	
Black field cricket Field crickets, Mole crickets	Chlorpyrifos			
Spur-throated locust	Chlorpyrifos			
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Fenitrothion	**1B**	EU: No authorisation in place	
Wingless grasshopper	Chlorpyrifos	**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: Cancellation of use USA:EPA decision to allow continued use	
	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	

Problem	Active Constituents	Chemical Group	Comment	Actions
Jassids/Plant bugs				
Bugs	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
Green vegetable bug	Deltamethrin	**3A**		
	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
Jassids	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
Leafhoppers	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Paraffinic / petroleum oil			
	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	

Problem	Active Constituents	Chemical Group	Comment	Actions
Rutherglen bug	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
Mites				
Blue oat mite	Omethoate	**1B**	Codex: No MRLs Canada: No approvals in place EU: No authorisations in place USA: No approvals in place	ST19020 Data generation project for a label registration Spiromesifen (Oberon 240SC) Group 23
Mites	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Paraffinic oil			
	Petroleum oil			
Pasture mite	Omethoate	**1B**	Codex: No MRLs Canada: No approvals in place EU: No authorisations in place USA: No approvals in place	
Spider mites (Red spider)	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Propargite	**12C**	APVMA: nominated for review	
Two-spotted (Red spider) mite	Propargite	**12C**	APVMA: nominated for review	
Redlegged earth mite	Bifenthrin	**3A**	Canada: Subject to phase-out until 31/12/2020 EU: No authorisation in place	
	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Omethoate	**1B**	Codex: No MRLs Canada: No approvals in place EU: No authorisations in place USA: No approvals in place	

Problem	Active Constituents	Chemical Group	Comment	Actions
Thrips				
Bean blossom thrips	Diazinon	**1B**	EU: Deregistered Codex: To be reviewed.	
Bean thrips	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
Plague thrips	Esfenvalerate	**3A**		
Thrips	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Paraffinic oil			
	Petroleum oil			
	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
Tomato thrips	Spirotetramat	**23**		
Western flower thrips	Methomyl	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Spinetoram	**5**		
	Spirotetramat	**23**		

Problem	Active Constituents	Chemical Group	Comment	Actions
Western flower thrips	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
		Whitefly		
Greenhouse whitefly	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	
Silverleaf (Poinsettia) whitefly	Bifenthrin	**3A**	Canada: Subject to phase-out until 31/12/2020 EU: No authorisation in place	
	Imidacloprid (PER85103)	**4A**	APVMA: Under review Canada: Under review EU: Removal of all field uses USA: Re-registration with new risk mitigation measures	
	Methomyl (PER85103) Qld only	**1A**	APVMA: nominated for review Canada: Re-evaluation completed (2018). Majority of uses removed EU: No authorisation	
	Pyriproxyfen (PER84890)	**7C**	EU: Re-authorised 2020	
	Spirotetramat	**23**		
	Thiamethoxam + chlorantraniliprole (PER87809)	**4A + 28**	APVMA: Under review Canada: Proposal to deregister outdoor uses Europe: Outdoor uses deregistered USA: Re-registration with new risk mitigation measures	

Problem	Active Constituents	Chemical Group	Comment	Actions
Other				
Lucerne flea	Dimethoate	**1B**	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
	Malathion/Maldison	**1B**	APVMA: Under review: chemistry Codex: Re-evaluation scheduled for 2022/23	
	Omethoate	**1B**	Codex: No MRLs Canada: No approvals in place EU: No authorisations in place USA: No approvals in place	
Black field earwig	Chlorpyrifos	**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: Cancellation of use USA:EPA decision to allow continued use	
Vegetable leafminer	Abamectin (PER81876)	**6**		
	Spinetoram (PER87878)	**5**		
	Spirotetramat (PER88640)	**23**		

Problem	Active Constituents	Chemical Group	Comment	Actions
Nematodes				
Nematodes	1,3-dichloropropene + chloropicrin	**8B**		
Nematodes: Cyst-forming	1,3-dichloropropene + chloropicrin	**8B**		
Snails & slugs				
Brown field slug	Metaldehyde		UK: Outdoor use being phased-out by 31 March 2022	
Pointed (Conical) snail	Metaldehyde			
Reticulated (Grey field) slug	Metaldehyde			
Slugs	Metaldehyde			
Small brown snail	Metaldehyde			
Snails	Metaldehyde			
White Italian (Sand dune) snail	Metaldehyde			

Problem	Active Constituents	Chemical Group	Comment	Actions
DISEASES				
Angular leaf spot	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
	Sulfur	**M2**		
Anthracnose	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
	Zineb	**M3**	APVMA: Nominated for review Codex: To be reviewed 2022/23 EU: No authorisation in place	
	Metiram	**M3**	APVMA: Nominated for review Canada: Proposed cancelling of foliar uses Codex: To be reviewed 2022/23 EU: Under review	
	Sulfur	**M2**		
Bacterial brown spot	Copper	**M1**	EU: Candidate for substitution	
	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
Black spot	Mancozeb	**M3**		
Blight	Copper	**M1**	EU: Candidate for substitution	
Chocolate spot (Grey mould)	Copper	**M1**	EU: Candidate for substitution	
	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
	Sulfur	**M2**		

Problem	Active Constituents	Chemical Group	Comment	Actions
Common bacterial blight	Copper	**M1**	EU: Candidate for substitution	
	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
Damping off	Thiram	**M3**	APVMA: Nominated for review Canada: Cancelled all foliar uses Codex: To be reviewed 2022/23 Europe: No authorisation in place	
Fungal diseases: Sclerotinia	Iprodione (PER84955)	**2**	Europe: Deregistered Canada: Majority of food crop uses deleted Codex: Review scheduled for 2022/23	
Grey mould	Cyprodinil	**9**	Canada: Under review EU: Candidate for substitution	
	Fludioxonil	**12**	EU: Under review & Candidate for substitution	
	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
Halo blight	Copper	**M1**	EU: Candidate for substitution	
	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
Leaf & pod spot	Mancozeb	**M3**		
Leaf blight	Mancozeb	**M3**		
	Sulfur	**M2**		
Leaf diseases/spots	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	

Problem	Active Constituents	Chemical Group	Comment	Actions
Rust	Bitertanol	**3**	EU: No authorisation in place	
	Copper	**M1**	EU: Candidate for substitution	
	Mancozeb	**M3**	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2022/23 EU: Authorisation not renewed	
	Metiram	**M3**	APVMA: Nominated for review Canada: Proposed cancelling of foliar uses Codex: To be reviewed 2022/23 EU: Under review	
	Oxycarboxin	**7**	EU: No authorisation in place	
	Sulfur	**M2**		
	Tebuconazole	**3**	APVMA: Nominated for review EU: Candidate for substitution	
	Zineb	**M3**	APVMA: Nominated for review Codex: To be reviewed 2022/23 EU: No authorisation in place	
Sclerotinia rot	Azoxystrobin	**11**		
	Boscalid	**7**		
	Cyprodinil	**9**	Canada: Under review EU: Candidate for substitution	
	Fludioxonil	**12**	EU: Under review EU: Candidate for substitution	
	Mandestrobin	**11**		

Problem	Active Constituents	Chemical Group	Comment	Actions
WEEDS				
Broadleaf weeds and grasses	Acifluorfen	**G**		
	Bentazone	**C**		
	Chlorthal-dimethyl	**D**	EU: No authorisation in place	
	Clethodim (PER86530)	**A**	Codex: MRLs proposed for deletion	
	Clomazone	**Q**		
	Dimethenamid-P	**K**		
	Diquat	**L**	APVMA: Currently under review EU: No authorisation in place	
	Fluazifop-P	**A**		
	Glufosinate	**N**	EU: No authorisation in place	
	Glyphosate	**M**	Ongoing issues internationally	
	Metolachlor +S-metolachlor (PER13626)	**K**		
	Pendimethalin	**D**	EU: Candidate for substitution	
	Quizalofop-P	**A**	Canada: Under re-evaluation: proposed completion June 2019. EU: Candidate for substitution	
	Sethoxydim	**A**	EU: No authorisation in place	
	Trifluralin	**D**	EU: No authorisation in place	

MT20007: Regulatory support and coordination. This multi-industry project has been funded by Hort Innovation using industry research and development levies and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.