



Beetroot

Strategic Agrichemical Review Process
(SARP)

April 2026

Hort Innovation
Project – MT25005

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SARP Service Provider:

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Purpose of the report:

This report was funded by Hort Innovation to investigate the pest problem, agrichemical usage and pest management alternatives for the Beetroot 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 2026

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**Hort
Innovation**
Strategic levy investment

**VEGETABLE
FUND**

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1. Summary

The strategic levy investment project Vegetable Industry SARP Report Updates (MT25005) 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 beetroot 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 is:

Common name	Scientific name
Rhizoctonia	<i>Rhizoctonia solani</i>
Alternaria Leaf Spot	<i>Alternaria</i> spp.
Cercospora Leaf Spot	<i>Cercospora beticola</i>
Damping Off	<i>Pythium aphanidermatum</i>

1.2 Insects and Mites

The high priority insects and mites are:

Common name	Scientific name
Cutworms	<i>Agrotis</i> spp.
Webworm	<i>Spoladea recurvalis</i>

1.3 Weeds

The high priority weeds are:

Common Name	Scientific Name
Annual Ryegrass	<i>Lolium rigidum</i>
Wild Radish	<i>Raphanus raphanistrum</i>
Feathertop Rhodes Grass	<i>Chloris virgata</i>
Wireweed	<i>Polygonum aviculare</i>
Red-Root Amaranth	<i>Amaranthus retroflexus</i>
Stinging Nettle	<i>Urtica</i> spp.

2. The Australian Beetroot Industry

The Australian Beetroot industry is a minor horticultural industry. Beetroot production occurs predominantly in Queensland centred in the Lockyer and Fassifern Valleys. Volumes grown for processing have decreased in recent years, with most of the processed volume tinned.

Fresh beetroot is available for the domestic market on a year-round basis. Total production for the year ending June 2025 was 19,090 tonnes and was valued at \$14.9 million¹. The majority (60%) is processed, while 38% goes to fresh supply, and 2% goes to fresh export.

Fresh Beetroot Seasonality by State

State	24/25 Tonnes	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Queensland	16,224	High	High	Medium	Low	Low	Low	Low	Low	Low	Low	Low	Low
Western Australia	1,395	Low	Low	Low	None	None	None	None	None	None	Low	Low	Low
New South Wales	1,195	High	Medium	Medium	Low	Low	Low	Low	Low	Low	Low	Low	High
Victoria	276	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	High
Availability Legend		High	High		Medium	Medium		Low	Low			None	None

Australia is a net exporter of beetroot. For the year ending June 2025, Australia exported 418 tonnes of fresh beetroot. Of this export, 38.5% went to Japan, 20.1% went to Singapore, 8.2% went to UAE, 7.6% went to Malaysia and 6% went to Hong Kong.

¹ Hort Innovation (2026). Australian Horticulture Statistics Handbook 2024/25. [online] Available at: <https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/australian-horticulture-statistics-handbook/>

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 beetroot 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 beetroot industry regarding pesticide access, Hort Innovation undertook a review of the pesticide requirements via a Strategic Agrichemical Review Process (SARP) in 2021. 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 beetroot 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 beetroot 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 beetroot 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 Industry² which covers beetroot outlines key threats to the industry, risk mitigation plans, identification and categorisation of exotic pests and contingency plans. High priority exotic pests have been assessed based on their potential to enter, establish, and spread in Australia (e.g. environmental factors, host range, vectors) and the cost to industry of control measures.

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

3.2 Minor use permits and registration

From a pesticide access perspective, the APVMA classifies beetroot as a minor crop. The crop fits within the APVMA crop group VR0075: Root and tuber vegetables, within the subgroup VR0574: Beetroot. Therefore, access to minor use permits can be relatively straight forward as long as a reasonable justification is provided in accordance with the APVMA's minor use guidance³.

Possible justification for future permit applications could be based on:

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

With each of these options, sound, scientific argument is required to justify any new permit applications. Another option for the beetroot 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 Beetroot Strategic Agrichemical Review Process (SARP), which was last updated in 2021, was conducted by desktop audit and industry consultation. The process included gathering, collating and confirming information:

Hort Innovation Project Reference	Process of Review - Activity
<p>MT25005 – Vegetable Strategic Agrichemical Review Process (SARP) 2026 Updates</p>	<p>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) through consultation meetings with key industry personnel. 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 MT24008 Regulatory Support & Response Co-ordination (pesticides) – DTS Pty Ltd. 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</p>
<p>MT24008 – Regulatory Support & Response Co-ordination (pesticides) DTS Pty Ltd</p>	<p>Beetroot 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 MT24008 to highlight the regulatory threats to agrichemicals currently approved for the management of the pests and diseases in Beetroot as well as current initiatives aimed at addressing identified pest management deficiencies.</p>

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 beetroot

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

Appendix 3. Products available for weed control in beetroot

Appendix 4. Current permits for use in beetroot

Appendix 5. Beetroot Maximum Residue Limits (MRLs)

Appendix 6. Beetroot Agrichemical Regulatory Risk Assessment

4. Diseases, Pests and Weeds of Beetroot

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

In Chapter 4 information on regulatory risk derived from project MT24008 (Regulatory support and response 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 beetroot

4.1.1 Disease priorities

Common name	Scientific name
High	
Rhizoctonia	<i>Rhizoctonia solani</i>
Alternaria Leaf Spot	<i>Alternaria</i> spp.
Cercospora Leaf Spot	<i>Cercospora beticola</i>
Damping Off	<i>Pythium aphanidermatum</i>
Moderate	
Seedling Blight	<i>Aphanomyces cochlioides</i>
Bacterial Leaf Spot	<i>Pseudomonas syringae</i>
Low	
Sclerotinia Rot	<i>Sclerotinia</i> spp.
Downy Mildew	<i>Peronospora farinosa</i>
Powdery Mildew	<i>Erysiphe polygoni</i>
Phoma Leaf Spot	<i>Phoma beta</i>
Ring Spot	<i>Mycosphaerella</i> spp.
Rust	<i>Uromyces betae</i>

The high priority diseases based on the feedback received were Rhizoctonia, Alternaria Leaf Spot, Cercospora Leaf Spot and Damping Off. Available and potential products for controlling diseases of beetroot are listed in Section 4.1.2.

Outbreaks of soil-borne diseases are favoured by warm, wet conditions particularly after rain events and in water-logged areas. Cultural controls are the most effective way to manage soil-borne disease in the longer term. These include crop rotation, cover cropping, general farm hygiene to destroy crop residues and remove weed hosts, and management of fields and irrigation practices to reduce waterlogging.

Resistance Management

Downy Mildew and Powdery Mildew are both considered to have a high risk of resistance development. In Australia there are confirmed cases of Powdery Mildew resistance to Group 8 Bupirimate, Group 11 Strobilurins and Group 3 Triadimenol.

There are several disease strategies that apply to vegetables on the CropLife website⁵, including Downy Mildew and Powdery 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 risk: Critical concern over retaining access < 1 year
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term risk: Maintaining access of significant concern <2-5 years
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required < 5 years
		R4	No current risk / concerns
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
Rhizoctonia (<i>Rhizoctonia solani</i>)							
Priority: High							
Rhizoctonia is ranked as a high priority. Rhizoctonia is a soil-borne disease which is widespread in different soil types. Infection results in reduced marketability of beets through marking and discolouration of the skin.							
1,3-Dichloropropene + Chloropicrin + (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of plant parasitic Nematodes, Symphyllans, Wireworms, soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) and suppression of weeds. Restricted chemical. For use by professional and registered fumigators only.	R4
Dazomet (Basamid)	8F	Soil Fumigant	NR	A	ALL	Pre-plant fumigant in seed beds for control of soil fungi including <i>Pythium</i> , <i>Phytophthora</i> , <i>Sclerotinia</i> , <i>Sclerotium</i> , <i>Rhizoctonia</i> , <i>Verticillium</i> , <i>Plasmodiophora</i> , <i>Armillaria</i> and <i>Fusarium</i> spp. Apply granules to the soil surface and incorporate and seal the soil surface immediately. Do not plant into soil until a positive germination test has been conducted.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fludioxonil + Sedaxane (Vibrance Premium) Syngenta	12+7	Seed Dressing	NR	A	ALL	Registered in beetroot as a seed dressing for the suppression of Rhizoctonia (<i>Rhizoctonia solani</i>). Apply prior to sowing in a slurry of sufficient water volume to ensure even coverage of the seed.	R4
Metalaxyl-M + Azoxystrobin (Uniform) PER90595	4+11	Protectant & Curative	NR	A	ALL (excl. VIC)	Permitted in beetroot as an in-furrow directed spray at planting for control of Pythium and Rhizoctonia . Maximum of 1 application per crop.	R4
Metham Sodium	-	Fumigant	NR	A	ALL	Registered in food crops as a pre-plant fumigant for control of fungus diseases including Rhizoctonia , <i>Pythium</i> , <i>Fusarium</i> , <i>Phytophthora</i> , <i>Verticillium</i> , <i>Sclerotinia</i> and Club Root of crucifers. Applied as a soil injection, soil surface spray in front of a rotary tiller or through approved trickle irrigation systems.	R4
<i>Streptomyces lydicus</i> WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological	NR	A	ALL	Registered in vegetables as a seed treatment for control of <i>Fusarium</i> , Rhizoctonia & <i>Pythium</i> .	R4
Tolclofos-Methyl (Rizolex) Sumitomo	14	Protectant & Curative	NR	A	QLD & NSW	Registered in beetroot for control of Rhizoctonia spp. Apply as in-furrow spray or by water injection at time of planting.	R4
Phosphorous Acid PER14184	33	Protectant & Curative	1	P-A	ALL (excl. VIC)	Permitted in beetroot for control of Damping Off (<i>Pythium</i> spp., <i>Phytophthora</i> spp., Rhizoctonia spp., <i>Fusarium</i> spp.)	R4
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in vegetables for application to soil to improve bioavailability of soil resources to horticultural crops.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Bacillus amyloliquefaciens</i> (Serenade Opti) Bayer	BM 02	Biological	NR	P		Registered in grapes and strawberries for control of Botrytis, in tomatoes, capsicums and chillies for suppression of Bacterial Spot and in avocado, other tropical fruit crops (excluding banana) and mango for control of Anthracnose and suppression of Stem End Rot.	R4
<i>Bacillus amyloliquefaciens</i> strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of <i>Botrytis</i> in grapes and strawberries in Australia. US registration for the management of <i>Pythium</i> spp., <i>Phytophthora</i> spp., <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp. in peppers.	R4
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 Powdery Mildew, Alternaria Leaf Spot, Gummy Stem Blight, Septoria, Botrytis, Cladosporium, Cercospora, Sclerotinia, Rust and Anthracnose and suppression of <i>Rhizoctonia</i> in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R4
Inpyrflumax (Excalia) Sumitomo	7	Protectant		P		Registered as an in-furrow spray at planting for control of soil-borne <i>Rhizoctonia</i> (<i>Rhizoctonia solani</i>) in potatoes.	R4
Thiophanate-Methyl + Etridiazole (Banrot)	1+14	Protectant		P		Registered in container grown ornamentals and in ground bedding plants as a post plant soil drench for control of <i>Pythium</i>, <i>Phytophthora</i>, <i>Rhizoctonia</i> and <i>Thielaviopsis</i> .	R4
Thiram + Thiabendazole (P-Pickel T)	1+M3	Protectant		P		Registered as a seed treatment for control of <i>Fusarium</i> and <i>Pythium</i> seedling root rots (<i>Macrophomina</i> spp.) in faba beans.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Alternaria Leaf Spot (<i>Alternaria</i> spp.) Priority: High							
Alternaria Leaf Spot is ranked as a high priority. Infection is favoured by cool, humid conditions and can be exacerbated by stress such as nutrient deficiencies.							
Chlorothalonil (Bravo) PER82895	M5	Protectant	7	A	ALL (excl. VIC)	Permitted for in beetroot for control of Alternaria spp. , <i>Botrytis</i> spp., Cercospora Leaf Spot (<i>Cercospora beticola</i>) and Phoma Leaf Spot (<i>Phoma betae</i>). Apply as a foliar spray as soon as conditions favour disease infection and development. Use a retreatment interval of 7-14 days. Maximum of 4 applications per crop.	R2
Copper as Cupric Hydroxide (Champ DP) Nufarm	M1	Protectant	1	A	ALL	Registered in root & tuber vegetables, including beetroot for control of Downy Mildew (<i>Peronospora farinosa</i>), Rust (<i>Uromyces betae</i>), Leaf Spot (Alternaria, Cercospora, Septoria) Target Spot / Early Blight (<i>Alternaria solani</i>) and Irish Blight / Late Blight (<i>Phytophthora infestans</i>). Apply as a foliar spray at the first sign of disease and use a retreatment interval of 10-14 days if conditions allow infection. Maximum number of applications per crop not specified.	R4
Difenoconazole (Digger) Nufarm	3	Protectant & Curative	7	A	ALL	Registered in beetroot for control of Alternaria Leaf Spot & Cercospora Leaf Spot. Apply as a foliar spray prior to occurrence of the disease. Use a re-treatment interval 10-14 days. Maximum of 6 applications per crop with no more than 2 consecutive applications.	R3
Iprodione (Rovral) PER81589	2	Curative	14 G:7	A	ALL (excl. VIC)	Permitted in beetroot for control of Alternaria Leaf Spot , Sclerotinia Rot and Grey Mould. Apply as a foliar spray when conditions favour disease development. Use a re-treatment interval 14 days. Maximum of 2 applications per crop.	R4
Mancozeb + Dimethomorph (Acrobat) PER14958	M3+40	Protectant & Curative	14 NG	A	ALL (excl. VIC)	Permitted in beetroot (field only) for control of Downy Mildew (<i>Peronospora</i> spp., <i>Pseudoperonospora</i> spp., <i>Bremia lactucae</i>) and Alternaria Leaf Spot (Alternaria spp.) Apply as a foliar spray when conditions favour disease development and prior to appearance of symptoms. Use a re-treatment interval of 7-10 days. Maximum of 4 applications per crop with no more than 2 consecutive applications.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mancozeb + Metalaxyl (Ridomil Gold MZ) Syngenta PER14045	M3+4	Protectant & Curative	14	A	ALL (excl. VIC)	Permitted in beetroot (field only) for control of Downy Mildew and Alternaria Leaf Spot . Apply as a foliar spray at first sign of disease or when conditions favour disease development. Use a re-treatment interval of 7-10 days. Maximum of 2 applications per crop.	R2
Penthiopyrad (Fontelis) Corteva	7	Protectant	7	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Early Blight (Alternaria spp.) and Powdery Mildew (<i>Erysiphe</i> spp.) Apply as a foliar spray prior to disease development. Use a retreatment interval of 7-14 days. Maximum of 2 applications per crop.	R4
Pydiflumetofen + Difenconazole (Miravis Duo) Syngenta	7+3	Protectant & Curative	7 NG	A	ALL	Registered in root vegetables, including beetroot, for control of Early Blight / Target Spot / Leaf Spot (Alternaria spp.) , Powdery Mildew (<i>Erysiphe</i> spp., <i>Oidium</i> spp.) and Cercospora Leaf Spot (<i>Cercospora</i> spp.) Apply as a foliar spray, commencing when conditions favour disease development and before the onset of symptoms. Use a retreatment interval of 7-10 days. Maximum of 2 applications per crop.	R3
Trifloxystrobin (Flint) PER14891	11	Protectant & Curative	7 G:7	A	ALL (excl. VIC)	Permitted in beetroot for control of Alternaria Leaf Spot and Cercospora Leaf Spot. Apply as a foliar spray at the first sign of conditions that favour disease development. Use a minimum retreatment interval of 10 days. Maximum of 3 applications per crop. Do not apply consecutive applications.	R4
Boscalid (Filan) BASF	7	Protectant	7	P-A	ALL	Registered in root and tuber vegetables for control of Sclerotinia Rot (<i>Sclerotinia minor</i> , <i>S. sclerotiorum</i>). Registered for control of Alternaria in potatoes, capsicum, eggplant, peppers and tomatoes.	R4
<i>Bacillus amyloliquifaciens</i> (Serenade Opti) Bayer	BM 02	Biological	NR	P		Registered in grapes and strawberries for control of Botrytis, in tomatoes, capsicums and chillies for suppression of Bacterial Spot and in avocado, other tropical fruit crops (excluding banana) and mango for control of Anthracnose and suppression of Stem End Rot. US registration for control of Alternaria in berries, brassica vegetables, citrus, bulb vegetables, herbs/spices, root/tuber and corm vegetables, stone fruit and tree nuts.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Bacillus amyloliquefaciens</i> strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of Botrytis in grapevines and strawberries. US registration for control of Alternaria in artichoke, asparagus, berries, brassica leafy vegetables, bulb vegetables, citrus, cucurbits, pome fruit, stone fruit and tobacco.	R4
Florypicoxamid (Verpixo Adavelt) Corteva	21	Protectant & Curative		P		Registered for control of Target Spot (<i>Alternaria solani</i>) in capsicum, chilli, eggplant, okra and tomato.	R4
Fluazinam (Shirlan) Syngenta	29	Protectant		P		Registered in Brassica vegetables for control of Club Root. US registration for control of Alternaria in carrots.	R4
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 Alternaria in almond, Brassica leafy greens, bulb vegetables, cucurbits, pistachio, tree nuts and sunflower.	R4
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of Alternaria , Black Spot and Powdery Mildew in apples, Black Spot in pears, Blossom Blight, Brown Rot, Hull Rot, Shot Hole and Rust in stone fruit, and various leaf diseases in tropical fruits. US registration for control of Alternaria in almond, Brassica vegetables, Brassica leafy vegetables, carrot, citrus, pome fruit, small vine climbing fruit except kiwi fruit, leafy greens, cucurbits, tree nuts, fruiting vegetables & root vegetables except sugar beet.	R4
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered for control of Alternaria Leaf Spot, Black Spot, Brown Rot Nut Scab, Shot Hole and Rust in almond, Brown Rot in cherries and Husk Spot in macadamia. US registration for control of Alternaria Leaf Blight , Powdery Mildew, Anthracnose, Cercospora Leaf Spot, Gummy Stem Blight, Microdochium Blight, Target Leaf Spot and suppression of Downy Mildew in cucurbits.	R4
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for suppression of Alternaria (<i>Alternaria mali</i>) in apples.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Polyoxin-D (Intervene) Nufarm	19	Protectant		P		Pending registration for control of Botrytis and Powdery Mildew in grapes, Botrytis, Powdery Mildew and Rhizopus Fruit Rot in berries, and Powdery Mildew, Alternaria and Fruit Spot in apples.	R4
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of Botrytis in berries and grapes, and Botrytis and Sclerotinia in leafy vegetables and potato. US registration for control of Alternaria in berries, brassica vegetables, bulb vegetables, carrots, cucurbits, fruiting vegetables, grape and small fruit vine climbing (except fuzzy kiwifruit), specific leaf petioles, specific leafy greens, root and tuber vegetables, lemon and lime, mustard greens, pistachio, potato, root vegetables and tuberous and corm vegetables.	R4
Cercospora Leaf Spot (<i>Cercospora beticola</i>)							
Priority: High							
Cercospora Leaf Spot is ranked as a high priority. Cercospora is transmitted through undecomposed crop residues, weed hosts and via seed. Outbreaks are favoured by warm, showery weather and severe infections can result in reduced size of beets.							
Chlorothalonil (Bravo) PER82895	M5	Protectant	7	A	ALL (excl. VIC)	Permitted for in beetroot for control of <i>Alternaria</i> spp., <i>Botrytis</i> spp., Cercospora Leaf Spot (<i>Cercospora beticola</i>) and Phoma Leaf Spot (<i>Phoma betae</i>). Apply as a foliar spray as soon as conditions favour disease infection and development. Use a retreatment interval of 7-14 days. Maximum of 4 applications per crop.	R2
Copper as Cupric Hydroxide (Champ DP) Nufarm	M1	Protectant	1	A	ALL	Registered in root & tuber vegetables, including beetroot for control of Downy Mildew (<i>Peronospora farinosa</i>), Rust (<i>Uromyces betae</i>), Leaf Spot (<i>Alternaria</i> , Cercospora , <i>Septoria</i>) Target Spot / Early Blight (<i>Alternaria solani</i>) and Irish Blight / Late Blight (<i>Phytophthora infestans</i>). Apply as a foliar spray at the first sign of disease and use a retreatment interval of 10-14 days if conditions allow infection. Maximum number of applications per crop not specified.	R4
Difenoconazole (Digger) Nufarm	3	Protectant & Curative	7	A	ALL	Registered in beetroot for control of <i>Alternaria</i> Leaf Spot & Cercospora Leaf Spot . Apply as a foliar spray prior to occurrence of the disease. Use a re-treatment interval 10-14 days. Maximum of 6 applications per crop with no more than 2 consecutive applications.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mancozeb	M3	Protectant	14	A	ALL	Registered in beetroot for control of Cercospora Leaf Spot & Downy Mildew. Apply as a foliar spray at first sign of disease. Use a retreatment interval of 7-10 days. Maximum number of applications not specified.	R2
Propiconazole (Tilt) PER14479	3	Protectant & Curative	7	A	ALL (excl. VIC)	Permitted in beetroot (field) for control of Cercospora Leaf Spot . Apply as a foliar spray when disease symptoms are first observed. Use a retreatment interval of 14 days. Maximum of 5 applications per crop with no more than 3 consecutive applications.	R3
Pydiflumetofen + Difenconazole (Miravis Duo) Syngenta	7+3	Protectant & Curative	7 NG	A	ALL	Registered in root vegetables, including beetroot, for control of Early Blight / Target Spot / Leaf Spot (<i>Alternaria</i> spp.), Powdery Mildew (<i>Erysiphe</i> spp., <i>Oidium</i> spp.) and Cercospora Leaf Spot (<i>Cercospora</i> spp.) Apply as a foliar spray, commencing when conditions favour disease development and before the onset of symptoms. Use a retreatment interval of 7-10 days. Maximum of 2 applications per crop.	R3
Trifloxystrobin (Flint) PER14891	11	Protectant & Curative	7 G:7	A	ALL (excl. VIC)	Permitted in beetroot for control of Alternaria Leaf Spot and Cercospora Leaf Spot . Apply as a foliar spray at the first sign of conditions that favour disease development. Use a minimum retreatment interval of 10 days. Maximum of 3 applications per crop. Do not apply consecutive applications.	R4
Zineb	M3	Protectant	7	A	ALL	Registered in beets for control of Cercospora Leaf Spot . Apply as a foliar spray at first sign of disease. Maximum number of applications and re-treatment interval not specified.	R2
Copper	M1	Protectant	1	P-A	ALL	Registered in red beet for control of Downy Mildew and Rust. Registered for control of Cercospora spp. in bananas, fig and celery.	R4
<i>Bacillus amyloliquefaciens</i> (Serenade Opti) Bayer	BM 02	Biological		P		Registered in grapes and strawberries for control of Botrytis, in tomatoes, capsicums and chillies for suppression of Bacterial Spot and in avocado, other tropical fruit crops (excluding banana) and mango for control of Anthracnose and suppression of Stem End Rot.	R4
<i>Bacillus amyloliquefaciens</i> strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of <i>Botrytis</i> in grapes and strawberries. US registration for control of Cercospora in leafy vegetables, sugar beet and tobacco.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Florylpicoxamid (Verpixo Adavelt) Corteva	21	Protectant & Curative		P		Registered for control of various diseases in cucurbits, capsicum, chilli, eggplant, okra, tomato, lettuce and strawberry. Pending US registration for control of Cercospora in sugar beet.	R4
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, <i>Botrytis</i> , <i>Cladosporium</i> , Cercospora , <i>Sclerotinia</i> and Anthracnose in almond, Brassica leafy vegetables, legume vegetables, melons and various fruit crops.	R4
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of various leaf diseases in almonds, pome fruit, stone fruit and tropical and sub-tropical fruit (inedible peel). US registration for control of Cercospora in peanuts and sugarbeet.	R4
Hydrogen Peroxide + Peroxyacetic Acid (Peratec Plus)	M	Protectant		P		Registered for control of Cercospora spp. in celery.	R4
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 Cercospora in corn, legume vegetables, peanuts, sorghum, millet, soybean and sugar beet.	R4
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of Botrytis in berries and grapes, and Botrytis and Sclerotinia in leafy vegetables and potato. US registration for control of Cercospora in brassicas, carrots, cucurbits, stalk vegetables and root and tuber vegetables.	R4
Tebuconazole + Azoxystrobin (Veritas) Adama	3+11	Protectant		P		Registered for control of Cercospora Leaf Spot in faba beans and broad beans.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Damping Off (<i>Pythium aphanidermatum</i>) Priority: High							
Damping Off is ranked as a high priority. Symptoms of Damping Off consist of poor seed germination, pre-emergence and death of seedlings, post-emergence death of newly emerged seedlings, stunted plants, yellowed lower leaves, general poor growth, wilting, and eventual collapse and death of older plants. Roots of infected plants can appear water-soaked or brown to black in colour. In severe cases, nearly all roots may be girdled or rotted off. While all stages of beetroot can be infected by root rot organisms, newly emerging plants and young seedlings are very susceptible. Control options are limited and include the use of crop rotation to break the disease cycle.							
1,3-Dichloropropene + Chloropicrin + (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of plant parasitic Nematodes, Symphylans, Wireworms, soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) and suppression of weeds. Restricted chemical. For use by professional and registered fumigators only.	R4
Dazomet (Basamid)	8F	Soil Fumigant	NR	A	ALL	Pre-plant fumigant in seed beds for control of soil fungi including <i>Pythium</i> , <i>Phytophthora</i> , <i>Sclerotinia</i> , <i>Sclerotium</i> , <i>Rhizoctonia</i> , <i>Verticillium</i> , <i>Plasmodiophora</i> , <i>Armillaria</i> and <i>Fusarium</i> spp. Apply granules to the soil surface and incorporate and seal the soil surface immediately. Do not plant into soil until a positive germination test has been conducted.	R4
Metalaxyl-M (Apron)	4	Protectant Seed Treatment	NR	A	ALL	Registered in beetroot as a seed treatment for control of Damping Off . Apply diluted with water before sowing.	R4
Metalaxyl-M + Azoxystrobin (Uniform) PER90595	4+11	Protectant & Curative	NR	A	ALL (excl. VIC)	Permitted in beetroot as an in-furrow directed spray at planting for control of <i>Pythium</i> and <i>Rhizoctonia</i> . Maximum of 1 application per crop.	R4
Metham Sodium	-	Fumigant	NR	A	ALL	Registered in food crops as a pre-plant fumigant for control of fungus diseases including <i>Rhizoctonia</i> , <i>Pythium</i> , <i>Fusarium</i> , <i>Phytophthora</i> , <i>Verticillium</i> , <i>Sclerotinia</i> and Club Root of crucifers. Applied as a soil injection, soil surface spray in front of a rotary tiller or through approved trickle irrigation systems.	R4
Phosphorous Acid PER14184	33	Protectant & Curative	1	A	ALL (excl. VIC)	Permitted in beetroot for control of Damping Off . Apply as a foliar spray when conditions favour disease development. Use a minimum retreatment interval of 7 days. Maximum of 4 applications per crop.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Streptomyces lydicus</i> WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological	NR	A	ALL	Registered in vegetables as a seed treatment for <i>Fusarium</i> , <i>Rhizoctonia</i> & <i>Pythium</i> Management.	R4
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in vegetables for application to soil to improve bioavailability of soil resources to horticultural crops.	R4
Amisulbrom (Amishield) Nufarm	21	Protectant		P		Registered for suppression of Damping Off in brassica vegetables.	R4
<i>Bacillus amyloliquefaciens</i> (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of <i>Botrytis</i> in grapes. US registration for control of Pythium Damping Off in artichoke, asparagus, brassica leafy vegetables, bulb vegetables, citrus, cucurbits, corn, fruiting vegetables, legume vegetables, oilseeds, soybean, strawberry and root and tuber vegetables (except sugar beet).	R4
Cyazofamid (Ranman) UPL	21	Protectant & Curative		P		Registered in Brassica leafy vegetable seedlings for the control of Downy Mildew. US registration for control of <i>Pythium spp.</i> in carrot, leafy greens, succulent-podded and succulent-shelled beans, tuberous and corm vegetables, tomato greenhouse transplants and greenhouse-grown bell peppers.	R4
Thiophanate-Methyl + Etridiazole (Banrot)	1+14	Protectant		P		Registered in container grown ornamentals and in ground bedding plants as a post plant soil drench for control of <i>Pythium</i> , <i>Phytophthora</i> , <i>Rhizoctonia</i> and <i>Thielaviopsis</i> .	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Seedling Blight (<i>Aphanomyces cochlioides</i>) Priority: Moderate Seedling Blight is ranked as a moderate priority. Seedling Blight is a soil-borne disease that survives in crop residues and in the soil. Cultural controls such as crop rotation, farm hygiene, cover crops and improving soil drainage are important management techniques. Soil fumigation should only be used for severe infestations.							
1,3-Dichloropropene + Chloropicrin + (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of plant parasitic Nematodes, Symphylans, Wireworms, soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) and suppression of weeds. Restricted chemical. For use by professional and registered fumigators only.	R4
Dazomet (Basamid)	8F	Soil Fumigant	NR	A	ALL	Pre-plant fumigant in seed beds for control of soil fungi including <i>Pythium</i> , <i>Phytophthora</i> , <i>Sclerotinia</i> , <i>Sclerotium</i> , <i>Rhizoctonia</i> , <i>Verticillium</i> , <i>Plasmodiophora</i> , <i>Armillaria</i> and <i>Fusarium</i> spp. Apply granules to the soil surface and incorporate and seal the soil surface immediately. Do not plant into soil until a positive germination test has been conducted.	R4
Metham Sodium	-	Fumigant	NR	A	ALL	Registered in food crops as a pre-plant fumigant for control of fungus diseases including <i>Rhizoctonia</i> , <i>Pythium</i> , <i>Fusarium</i> , <i>Phytophthora</i> , <i>Verticillium</i> , <i>Sclerotinia</i> and Club Root of crucifers. Applied as a soil injection, soil surface spray in front of a rotary tiller or through approved trickle irrigation systems.	R4
Hymexazol (Tachigaren) Mitsui Chemicals	32	Curative		P		Not registered in Australia. US registration as a soil and seed treatment for control of soil-borne diseases caused by <i>Fusarium</i> , <i>Aphanomyces</i> , <i>Pythium</i> , and <i>Corticium</i> spp. in rice, sugar beet, fodder beet, vegetables, cucurbits, ornamentals, carnations, and forest tree seedlings.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Bacterial Leaf Spot (<i>Pseudomonas syringae</i>) Priority: Moderate Bacterial Leaf Spot is ranked as a moderate priority. <i>Pseudomonas syringae</i> can be moved by wind, rain, and transportation via nursery material. Mechanical equipment and pruning tools may be a frequently overlooked means of dispersal. Cultural management, host resistance, biological control with microbial antagonists would help in controlling this disease.							
Copper as Tribasic Copper Sulphate, Copper Ammonium Complex, Copper Oxochloride, Cuprous Oxide	M1	Protectant	1	P-A	ALL	Registered in red beet for control of Downy Mildew and Rust. Registered for control of Bacterial Spot in stone fruit, brassica vegetables, cucurbits, peas and tomatoes.	R4
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant	NR	P		Registered to reduce symptoms of Bacterial Speck (<i>Pseudomonas syringae</i>) in tomatoes.	R4
<i>Bacillus amyloliquefaciens</i> (Serenade Opti) Bayer	BM 02	Biological	NR	P		Permitted for suppression of Bacterial Blight in lettuce.	R4
<i>Bacillus amyloliquefaciens</i> strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered in grapes and strawberries for control of Botrytis. US registration for control of <i>Pseudomonas spp.</i> in berries, fruiting vegetables, leafy vegetables, stone fruit, tobacco and tree nuts.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Sclerotinia Rot (<i>Sclerotinia</i> spp.) Priority: Low Sclerotinia Rot is ranked as a low priority. Sclerotinia tends to be a problem at canopy closure, particularly if plants have sustained mechanical injuries. Management options include general farm hygiene, crop rotation, planting space (to allow air movement) and the use of protectant and curative fungicide spray applications when conditions favour disease outbreaks. Correct timing and good penetration of foliage are essential for effective control.							
1,3-Dichloropropene + Chloropicrin + (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of plant parasitic Nematodes, Symphyllans, Wireworms, soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) and suppression of weeds. Restricted chemical. For use by professional and registered fumigators only.	R4
Boscalid (Filan) BASF	7	Protectant	7	A	ALL	Registered in root and tuber vegetables for control of Sclerotinia Rot (<i>Sclerotinia minor</i> , <i>S. sclerotiorum</i>). Apply as a program of 2 foliar sprays commencing before the disease has developed in crop. Use a retreatment interval of 7-14 days. Maximum of 4 applications per crop.	R4
Dazomet (Basamid)	8F	Soil Fumigant	NR	A	ALL	Pre-plant fumigant in seed beds for control of soil fungi including <i>Pythium</i> , <i>Phytophthora</i> , Sclerotinia , <i>Sclerotium</i> , <i>Rhizoctonia</i> , <i>Verticillium</i> , <i>Plasmodiophora</i> , <i>Armillaria</i> and <i>Fusarium</i> spp. Apply granules to the soil surface and incorporate and seal the soil surface immediately. Do not plant into soil until a positive germination test has been conducted.	R4
Iprodione (Rovral) PER81589	2	Protectant & Curative	14	A	ALL (excl. VIC)	Permitted in beetroot for control Alternaria Leaf Spot (<i>Alternaria</i> spp.), Sclerotinia Rot (<i>Sclerotinia</i> spp.) and Grey Mould (<i>Botrytis</i> spp.) Apply as a foliar spray when conditions favour disease development. Use a retreatment interval of 14 days. Maximum of 2 applications per crop.	R4
Metham Sodium	-	Fumigant	NR	A	ALL	Registered in food crops as a pre-plant fumigant for control of fungus diseases including <i>Rhizoctonia</i> , <i>Pythium</i> , <i>Fusarium</i> , <i>Phytophthora</i> , <i>Verticillium</i> , Sclerotinia and Club Root of crucifers. Applied as a soil injection, soil surface spray in front of a rotary tiller or through approved trickle irrigation systems.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Tebuconazole	3	Protectant & Curative	35 NG	A	ALL	Registered in beetroot (field only) for control of Sclerotinia Rot (<i>Sclerotinia</i> spp.) Apply as a foliar spray in the early stages of crop development. Use a retreatment interval of 7-10 days. Maximum of 2 applications per crop.	R4
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in vegetables for application to soil to improve bioavailability of soil resources to horticultural crops.	R4
Pydiflumetofen + Difenconazole (Miravis Duo) Syngenta	7+3	Protectant & Curative	7 NG	P-A	ALL	Registered in root vegetables, including beetroot, for control of Early Blight / Target Spot / Leaf Spot (<i>Alternaria</i> spp.), Powdery Mildew (<i>Erysiphe</i> spp., <i>Oidium</i> spp.) and Cercospora Leaf Spot (<i>Cercospora</i> spp.) Canadian registration for control of Sclerotinia in potato, root vegetables, tuberous and corm vegetables and fruiting vegetables.	R3
Penthiopyrad (Fontelis) Corteva	7	Protectant	7	P-A	ALL	Registered in beetroot for control of Early Blight and Powdery Mildew. Registered for control of Sclerotinia in brassica vegetables, brassica leafy vegetables and leafy vegetables.	R4
<i>Aureobasidium pullulans</i> (Botector) Nufarm	BM 02	Biological		P		Registered for suppression of Sclerotinia in fruiting vegetables.	R4
Azoxystrobin + Oxathiapiprolin (Orondis Flexi) Syngenta	11+49	Protectant & Curative		P		Registered for suppression of Sclerotinia in brassica vegetables, cucurbits, endive, leafy vegetables and lettuce.	R4
<i>Bacillus amyloliquefaciens</i> (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of <i>Botrytis</i> in grapes. US registration for the control of White Mould (<i>Sclerotinia sclerotium</i>), Botrytis Grey Mould, Powdery Mildew, Fusarium Wilt, Phytophthora Root Rot, Pythium Damping Off, Rhizoctonia Root Rot and Verticillium Wilt in legume vegetables.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Bacillus amyloliquefaciens</i> (Serenade Opti) Bayer	BM 02	Biological	NR	P		Registered for control Botrytis in strawberries and grapes, suppression of Bacterial Spot in tomato, chilli and capsicum and control of Anthracnose and suppression of Stem End Rot in tropical fruits. US registration for control of White Mould (<i>Sclerotinia sclerotium</i>) and Grey Mould (<i>Botrytis</i> spp.) in legume vegetables.	-
Cyprodinil + Fludioxonil (Switch) Syngenta	9+12	Protectant		P		Registered for control of Sclerotinia in capsicum, green beans, garden peas, snow peas, sugar snap peas, leafy vegetables, lettuce, nursery stock and ornamentals.	R4
Fluazinam (Shirlan)	29	Protectant		P		Registered for control of Club Root in brassica vegetables. US registration for control of Sclerotinia 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 of Sclerotinia in brassica leafy greens and sunflowers.	R4
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of Sclerotinia in lettuce.	R4
Mandestrobin (Intuity) Sumitomo	11	Protectant		P		Registered for control of White Mould (<i>Sclerotinia</i> spp.) in green beans and lettuce.	R4
Prothioconazole + Tebuconazole (Prosaro) Bayer	3	Protectant		P		Registered for control of Sclerotinia and other diseases in canola and pyrethrum.	R3
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of Sclerotinia in lettuce, leafy vegetables and potato.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Downy Mildew (<i>Peronospora farinosa</i>)							
Priority: Low							
Downy Mildew is ranked as a low priority. It is characterised by a white downy fungal growth that develops on the underside of the leaf. It is a common disease that is favoured by warm, moist weather. Management options include general farm hygiene, crop rotation, planting space (to allow air movement) and the use of protectant and curative fungicide spray applications when conditions favour disease outbreaks.							
Copper as Cupric Hydroxide (Champ DP) Nufarm	M1	Protectant	1	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Downy Mildew (<i>Peronospora farinosa</i>), Rust (<i>Uromyces betae</i>), Leaf Spot (<i>Alternaria</i> , <i>Cercospora</i> , <i>Septoria</i>), Target Spot / Early Blight (<i>Alternaria solani</i>) and Irish Blight / Late Blight (<i>Phytophthora infestans</i>). Apply as a foliar spray from the seedling stage until maturity while conditions allow infection. Use a retreatment interval of 10-14 days. Maximum number of applications per crop not specified.	R4
Copper as Tribasic Copper Sulphate, Copper Ammonium Complex, Copper Oxychloride, Cuprous Oxide	M1	Protectant	1	A	ALL	Registered in red beet for control of Downy Mildew (<i>Peronospora farinosa</i>) and Rust (<i>Uromyces betae</i>). Apply as a foliar spray from seedling stage until maturity. Use a retreatment interval of 10-14 days. Maximum number of applications per crop not specified.	R4
Dimethomorph + Ametoctradin (Zampro) AgNova	40+45	Protectant	14	A	ALL	Registered in beetroot for control of Downy Mildew (<i>Peronospora</i> spp.) Apply as a foliar spray when conditions favour disease development but before disease is evident. Use a retreatment interval of 7-10 days. Maximum of 2 applications per crop.	R4
Mancozeb	M3	Protectant	14	A	ALL	Registered in beetroot for control of Cercospora Leaf Spot & Downy Mildew . Apply as a foliar spray at first sign of disease. Use a retreatment interval of 7-10 days. Maximum number of applications per crop not specified.	R2
Mancozeb + Dimethomorph (Acrobat) PER14958	M3+40	Protectant & Curative	14 NG	A	ALL (excl. VIC)	Permitted in beetroot (field only) for control of Downy Mildew (<i>Peronospora</i> spp., <i>Pseudoperonospora</i> spp., <i>Bremia lactucae</i>) and Alternaria Leaf Spot (<i>Alternaria</i> spp.) Apply as a foliar spray when conditions favour disease development and prior to appearance of symptoms. Use a re-treatment interval of 7-10 days. Maximum of 4 applications per crop with no more than 2 consecutive applications.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mancozeb + Metalaxyl (Ridomil Gold MZ) Syngenta PER14045	M3+4	Protectant & Curative	14	A	ALL (excl. VIC)	Permitted in beetroot (field only) for control of Downy Mildew and Alternaria Leaf Spot. Apply as a foliar spray at first sign of disease or when conditions favour disease development. Use a re-treatment interval of 7-10 days. Maximum of 2 applications per crop.	R2
Phosphorous Acid PER14184	33	Curative	1	P-A	ALL (excl. VIC)	Permitted in beetroot for control of Damping Off. Registered for control of Downy Mildew in grapes.	R4
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered in tomatoes for the suppression of Bacterial Speck, Bacterial Spot, Bacterial Canker and Powdery Mildew. US registration for control of Downy Mildew in Brassica leafy vegetables, cucurbits, leafy vegetables, spinach, and suppression of Downy Mildew in bulb onion.	R4
Azoxystrobin + Oxathiapiprolin (Orondis Flexi) Syngenta	11+49	Protectant & Curative		P		Registered for the control of Downy Mildew in Brassica vegetables.	R4
Cyazofamid (Ranman) UPL	21	Protectant & Curative		P		Registered for the control of Downy Mildew in Brassica leafy vegetable seedlings. US registration for control of Downy Mildew in herbs, brassica leafy vegetables, cucurbits, grapes, hops, leafy greens, succulent-podded and succulent-shelled beans and bulb vegetables.	R4
Fluoxapiprolin (Xivana Prime 20SC) Bayer	49	Protectant & Curative		P		Registered for control of Downy Mildew in grapevines.	R4
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered in almonds, cherries and macadamia for control of various leaf diseases. US registration for suppression of Downy Mildew in bulb vegetables, cucurbits and leafy vegetables.	R4
Hydrogen Peroxide + Peroxyacetic Acid (Peratec Plus)	M	Protectant		P		Registered for control of Downy Mildew in brassica vegetables, bulb vegetables and grapes.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mandestrobin (Intuity) Sumitomo	11	Protectant		P		Registered for suppression Downy Mildew in onions.	R4
Mandipropamid (Revus) Syngenta	40	Protectant		P		Registered for control of Downy Mildew in grapes and brassica leafy crops.	R4
Orange Oil (Prev-Am) Oro Agri	-	Protectant	NR	P		Registered for control of Downy Mildew in bulb vegetables.	R4
Oxathiapiprolin (Zorvec Enicade) Corteva	49	Protectant		P		Registered for control of Downy Mildew in bulb vegetables, brassica vegetables, cucurbits, leafy vegetables, brassica leafy vegetables and poppies.	R4
Oxathiapiprolin + Mancozeb (Zorvec Enibel) Corteva	49+M3	Protectant		P		Registered for control of Downy Mildew in bulb vegetables.	R2
Polyoxin-D (Intervene) Nufarm	19	Protectant		P		Pending registration for control of Botrytis and Powdery Mildew in grapes, Botrytis, Powdery Mildew and Rhizopus Fruit Rot in berries, and Powdery Mildew, Alternaria and Fruit Spot in apples. US registration for control of Downy Mildew in ornamentals.	R4
Propamocarb Hydrochloride + Fluopicolide (Infinito) Bayer	28+43	Protectant		P		Registered for control of Downy Mildew in brassica vegetables, bulb vegetables, cucurbits, leafy vegetables, lettuce, poppies and potato.	R4
Propineb (Antracol) Bayer	M3	Protectant		P		Registered for control of Downy Mildew in cucurbits and onions.	R2
Propineb + Oxadixyl (Rebound) Kiwi Rural Trading	M3+4	Protectant & Curative		P		Registered for control of Downy Mildew in cucurbits, grape vines, lettuce and onions.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Powdery Mildew (<i>Erysiphe polygoni</i>)							
Priority: Low							
Powdery Mildew is ranked as a low priority. Powdery Mildew causes a characteristic white, powdery growth which predominantly affects the leaves. Photosynthetic efficiency is reduced in affected leaves, and this can lead to reduced beet yields.							
Penthiopyrad (Fontelis) Corteva	7	Protectant	7	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Early Blight (<i>Alternaria</i> spp.) and Powdery Mildew (<i>Erysiphe</i> spp.) Apply as a foliar spray prior to disease development. Use a retreatment interval of 7-14 days. Maximum of 2 applications per crop.	R4
Pydiflumetofen + Difenconazole (Miravis Duo) Syngenta	7+3	Protectant & Curative	7 NG	A	ALL	Registered in root vegetables, including beetroot, for control of Early Blight / Target Spot / Leaf Spot (<i>Alternaria</i> spp.), Powdery Mildew (<i>Erysiphe</i> spp., <i>Oidium</i> spp.) and Cercospora Leaf Spot (<i>Cercospora</i> spp.) Apply as a foliar spray, commencing when conditions favour disease development and before the onset of symptoms. Use a retreatment interval of 7-10 days. Maximum of 2 applications per crop.	R3
Sulphur	M2	Protectant	NR	A	ALL	Registered in vegetables for control of Powdery Mildew and Rust. Apply as a foliar spray when disease is first seen. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	R4
<i>Streptomyces lydicus</i> WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological	NR	P-A	ALL	Registered in vegetables as a seed treatment for <i>Fusarium</i> , <i>Rhizoctonia</i> & <i>Pythium</i> Management. Registered for suppression of Powdery Mildew in cucurbits.	R4
Trifloxystrobin (Flint) PER14891	11	Protectant & Curative	7 G:7	P-A	ALL (excl. VIC)	Permitted in beetroot for control of Alternaria Leaf Spot and Cercospora Leaf Spot. Registered for control of Powdery Mildew in apples, pears & grapevine.	R4
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered in tomatoes for the suppression of Bacterial Speck, Bacterial Spot, Bacterial Canker and Powdery Mildew. US registration for control of Powdery Mildew in cucurbits.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Bacillus amyloliquefaciens</i> (Serifel) BASF	BM02	Biological	NR	P		Registered in strawberries and berries (including blackberries, blueberries and raspberries) for control of Grey Mould (<i>Botrytis cinerea</i>). US registration for control of Powdery Mildew in artichoke, berries, brassica leafy vegetables, bulb vegetables, cucurbits, fruiting vegetables, grapes, hops, leafy vegetables, legume vegetables, pome fruit, stone fruit, sugar beet and tobacco.	-
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Opti) Bayer	BM02	Biological	NR	P		Registered in strawberries for control of Botrytis (<i>Botrytis cinerea</i>). Permitted for control of Powdery Mildew in eggplant. US registration for control of Powdery Mildew in cucurbits, grapes, pome fruit, stone fruit and strawberries.	-
BLAD (ProBlad Plus)	BM 01	Biological	NR	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 and strawberries.	R4
Boscalid + Kresoxim-Methyl (Colliss) BASF	7+11	Protectant & Curative		P		Registered for control of Powdery Mildew in cucurbits.	R4
Bupirimate (Nimrod) Adama	8	Protectant & Curative		P		Registered for control of Powdery Mildew in apples, cucurbits, cut flower, eggplant, melons, nursery stock, ornamentals, peppers and strawberries.	R4
Cyflufenamid (Flute) AgNova	U6	Protectant & Curative		P		Registered for control of Powdery Mildew in cucurbits, grapevines and strawberries.	R4
Florylpicoxamid (Verpixo Adavelt) Corteva	21	Protectant & Curative		P		Registered for control of Powdery Mildew in cucurbits, capsicum, chilli, eggplant, okra, tomato, strawberries and grapevines.	R4
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 Powdery Mildew in almonds, brassica leafy greens, cucurbits, grapes, hops, dry and succulent beans, stone fruit and sunflowers.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered for control of Powdery Mildew in fruiting vegetables, cucurbits and mangoes.	R4
Hydrogen Peroxide + Peroxyacetic Acid (Peratec Plus)	M	Protectant		P		Registered for control of Powdery Mildew in grapes, fruiting vegetables, cucurbits and potatoes.	R4
Mandestrobin (Intuity) Sumitomo	11	Protectant		P		Registered for control of Powdery Mildew in cucurbits.	R4
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Powdery Mildew in grapes, apples, cucurbits and fruiting vegetables.	R4
Metrafenone (Vivando) BASF	U8	Protectant		P		Registered for control of Powdery Mildew in cucurbits and grapes.	R4
Orange Oil (Prev-Am) Oro Agri	-	Protectant	NR	P		Registered for control of Powdery Mildew in fruiting vegetables, cucurbits, berries, apples and winegrapes.	R4
Polyoxin-D (Intervene) Nufarm	19	Protectant		P		Pending registration for control of Botrytis and Powdery Mildew in grapes, Botrytis, Powdery Mildew and Rhizopus Fruit Rot in berries, and Powdery Mildew , Alternaria and Fruit Spot in apples.	R4
Proquinazid (Talendo) Corteva	13	Protectant		P		Registered for control of Powdery Mildew in fruiting vegetables, cucurbits, grapes and pome fruit.	R4
Pyriofenone (Kusabi) AgNova	50	Protectant & Curative		P		Registered for control of Powdery Mildew in cucurbits and grapes.	R4
Tea Tree Oil (Timorex)	46	Protectant				Registered for control of Powdery Mildew in fruiting vegetables, cucurbits and grapes.	R4

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Phoma Leaf Rot (<i>Phoma beta</i>)							
Priority: Low							
Phoma Leaf Spot is ranked as a low priority. It is a soil-borne disease that can infect the leaves as well as the beets. Infections can cause seedling death in young crops and in later growth stages will cause abnormal root shape reducing quality of beets. Cultural control measures are important, particularly farm hygiene and crop rotation.							
Chlorothalonil (Bravo) PER82895	M5	Protectant	7	A	ALL (excl. VIC)	Permitted for in beetroot for control of <i>Alternaria</i> spp., <i>Botrytis</i> spp., Cercospora Leaf Spot (<i>Cercospora beticola</i>) and Phoma Leaf Spot (<i>Phoma betae</i>). Apply as a foliar spray as soon as conditions favour disease infection and development. Use a retreatment interval of 7-14 days. Maximum of 4 applications per crop.	R2
Fludioxonil + Sedaxane (Vibrance Premium) Syngenta	12+7	Seed Dressing	NR	P-A	ALL	Registered in beetroot as a seed dressing for the suppression of Rhizoctonia (<i>Rhizoctonia solani</i>). Registered as a seed treatment for control of Phoma spp. in potatoes.	R4
Cyprodinil + Fludioxonil (Switch) Syngenta	9+12	Protectant		P		Registered for control of Phoma spp. in pyrethrum.	R4
Ring Spot (<i>Mycosphaerella</i> spp.)							
Priority: Low							
Ring Spot is ranked as a low priority. Infections affect most parts of the plant and can cause economic losses by reducing beet size and quality. Cultural controls are important management techniques.							
Copper as Tribasic Copper Sulphate, Copper Ammonium Complex, Copper Oxychloride, Cuprous Oxide	M1	Protectant	1	P-A	ALL	Registered in red beet for control of Downy Mildew and Rust. Registered for control of Leaf Spot in strawberries.	R4

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.	R4
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered for control of Alternaria Leaf Spot, Black Spot, Brown Rot Nut Scab, Shot Hole and Rust in almond, Brown Rot in cherries and Husk Spot in macadamia. US registration for control of Leaf Spot in strawberries.	R4
Rust (Uromyces betae)							
Priority: Low							
Rust is ranked as a low priority.							
Copper as Cupric Hydroxide (Champ DP) Nufarm	M1	Protectant	1	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Downy Mildew (<i>Peronospora farinosa</i>), Rust (Uromyces betae) , Leaf Spot (<i>Alternaria</i> , <i>Cercospora</i> , <i>Septoria</i>), Target Spot / Early Blight (<i>Alternaria solani</i>) and Irish Blight / Late Blight (<i>Phytophthora infestans</i>). Apply as a foliar spray from the seedling stage until maturity while conditions allow infection. Use a retreatment interval of 10-14 days. Maximum number of applications per crop not specified.	R4
Copper as Tribasic Copper Sulphate, Copper Ammonium Complex, Copper Oxychloride, Cuprous Oxide	M1	Protectant	1	A	ALL	Registered in red beet for control of Downy Mildew (<i>Peronospora farinosa</i>) and Rust (Uromyces betae) . Apply as a foliar spray from seedling stage until maturity. Use a retreatment interval of 10-14 days. Maximum number of applications per crop not specified.	R4
Sulphur	M2	Protectant	NR	A	ALL	Registered in vegetables for control of Powdery Mildew and Rust . Apply as a foliar spray when disease is first seen. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	R4
Pydiflumetofen + Difenconazole (Miravis Duo) Syngenta	7+3	Protectant & Curative	7 NG	P-A	ALL	Registered in root vegetables, including beetroot, for control of Early Blight / Target Spot / Leaf Spot (<i>Alternaria</i> spp.), Powdery Mildew (<i>Erysiphe</i> spp., <i>Oidium</i> spp.) and Cercospora Leaf Spot (<i>Cercospora</i> spp.) US registration for control of Rust in stone fruit.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Azoxystrobin + Cyproconazole (Amistar Xtra) Syngenta	11+3	Protectant & Curative		P		Registered for control of Rust in maize, sweet corn and peanuts.	R3
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 Rust in almond, bulb vegetables, dry and succulent beans, stone fruit and sunflower.	R4

4.2 Insect and mite pests of beetroot

4.2.1 Insect and mite pest priorities

Common name	Scientific name
High	
Cutworms	<i>Agrotis</i> spp.
Webworm	<i>Spoladea recurvalis</i>
Moderate	
Beet Leafminer	<i>Liriomyza chenopodii</i>
Vegetable Leafminer	<i>Liriomyza sativae</i>
Serpentine Leafminer	<i>Liriomyza huidobrensis</i>
Cluster Caterpillar	<i>Spodoptera litura</i>
Jassids / Leafhoppers	Cicadellidae
Crickets	Gryllotalpidae
Wireworms	Tenebrionidae
Beet Cyst Nematode	<i>Heterodera schachtii</i>
Symphilids	<i>Scutigera immaculata</i>
Low	
Green Peach Aphid	<i>Myzus persicae</i>
Potato Aphid	<i>Macrosiphum euphorbiae</i>
Cotton Bollworm / Corn Earworm	<i>Helicoverpa armigera</i>
Native Budworm	<i>Helicoverpa punctigera</i>
European Earwig	<i>Forficula auricularia</i>
Rutherglen Bug	<i>Nysius vinitor</i>
Green Vegetable Bug	<i>Nezara viridula</i>
Looper Caterpillar	Geometridae
Two Spotted Mite	<i>Tetranychus urticae</i>
Vegetable Weevil	<i>Listroderes difficilis</i>

The high priority insect pests identified through industry consultation are Cutworms and Webworms. Available and potential products for these pests are listed in Section 4.2.2.

Soil insects can be highly damaging to root crops such as beetroot, and it is important to identify what species are causing crop damage. Sampling for soil insects is best conducted

using a baiting technique, such as outlined on Page 44 of the Cotton Pest Management Guide⁶. Crickets, Wireworms and Beet Cyst Nematode are only a problem in new ground.

Resistance to some insect groups has reduced control options despite a range of actives registered. Additionally, not all actives have broad registrations across Lepidoptera. Growers should not exceed the maximum number of applications permitted on the insecticide label.

Biological control involving other insects or fungal organisms in insect pest control is another option that need to be further evaluated. There are several identified biological control agents commercially available for pests in Australia.

Aphids are pests across many vegetables and specific resistance management strategies⁷ are available on the Croplife Australia website.

⁶ www.cottoninfo.com.au/publications/cotton-pest-management-guide

⁷ <https://www.croplife.org.au/resources/programs/resistance-management/various-cottonmelon-aphid-and-green-peach-aphid/>

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 risk: Critical concern over retaining access < 1 year
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term risk: Maintaining access of significant concern <2-5 years
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required < 5 years
		R4	No current risk / concerns
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 2025-26 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
Cutworms (<i>Agrotis</i> spp.) Priority: High Cutworm is ranked as a high priority, although they are not present in all growing regions. Cutworms are caterpillars that attack seedling crops by chewing through leaves and stems at ground level. Cutworms can be a pest of emerging seedlings but the incidence of this pest causing economic damage is generally rare in most crops, but it can impact plant densities. This pest is typically found along field margins that adjoin pastures or where crops have been sown into recently sprayed out weedy fallows. Soil pests can reduce plant establishment, row density and vigour. Symptoms can be confused with other establishment problems and may be worse if seedling development is slow due to climate or other factors. Soil pests, predominantly feed on germinating seed and seedling roots, resulting in poor establishment. Bait sampling prior to planting should be used to determine their presence. Clean fallows (free from weeds) generally cause pest insect numbers to decline due to a lack of food.								
Carbaryl	1A	Contact	3	A	ALL	Registered in root vegetables – beetroot for control of Brown Vegetable Weevil, Wingless Grasshopper, Green Vegetable Bug, Heliothis, Leaf Eating Ladybird, Cutworms , European Earwig, Potato Moth, Rutherglen Bug and Armyworm. Apply as a foliar spray at first sign of pest activity. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Methomyl PER82428	1A	Contact	7	P-A	ALL	Permitted for use in beetroot for control of <i>Helicoverpa</i> spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. Registered for control of Cutworms in tobacco.	H Bee:H	R2
Trichlorfon (Lepidex)	1B	Contact	2	P-A	ALL	Registered in vegetables for control of Cabbage White Butterfly, Cabbage Moth, Rutherglen Bug and Green Vegetable Bug. Registered for control of Cutworms in strawberries, beans, celery, crucifers, cucurbits, lettuce, peas, potatoes and tomato.	H Bee:H	R2
Alpha-Cypermethrin	3A	Contact		P		Registered for control of Cutworms in winter cereals, various pulse crops and grapevines.	VH Bee:H	R4
Chlorantraniliprole (Acelepryn) Syngenta	28	Ingestion		P		Registered for control of Black Cutworm in turf. Note that rate in turf is higher than in vegetables.	L Bee:VL	R4
Clothianidin + Imidacloprid (Poncho Plus Seed Treatment) BASF	4A	Contact & Ingestion		P		Registered for control of Cutworms as seed treatment in canola, forage brassicas, maize, sweet corn, sorghum, sunflower and pastures.	M Bee:M	R2
Cyantraniliprole + Thiamethoxam (Spinner) Syngenta	28+4A	Contact & Ingestion		P		Registered for control of Black Cutworm in turf.	M Bee:VH	R2
Indoxacarb (Provaunt) Syngenta	22A	Ingestion		P		Registered for control of Black Cutworm in turf.	L Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Webworm (<i>Spodoptera recurvalis</i>)								
Priority: High								
Webworm is ranked as a high priority, although it is not present in Tasmania. Webworm larvae are leaf-chewing pests of seedlings. 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.								
Methomyl PER82428	1A	Contact	7	A	ALL	Permitted for use in beetroot for control of <i>Helicoverpa</i> spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm , Rutherglen Bug and Thrips including Western Flower Thrips. Apply as a foliar spray when monitoring identifies early stages of a pest incursion. Use a retreatment interval of 7 days. Maximum of 3 applications per crop.	H Bee:H	R2
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 NG	P-A	ALL	Registered in root and tuber vegetables including beetroot for control of Diamondback Moth, Cabbage White Butterfly, Heliothis, Cluster Caterpillar and Loopers.	M Bee:H	R3
Spinetoram (Success Neo) Corteva	5	Ingestion	3	P-A	ALL	Registered in root and tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers, Helicoverpa and Potato Moth.	M Bee:H	R4
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	P-A	ALL	Registered in root & tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers, Helicoverpa and Potato Moth.	L Bee:L	R4
Chlorantraniliprole (Coragen) FMC	28	Ingestion		P		Registered for control of <i>Spodoptera</i> spp. in brassica vegetables, brassica leafy vegetables and strawberries.	L Bee:VL	R4
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered for control of a broad range of Lepidopteran pests in various vegetables crops.	L Bee:H	R3
Methoxyfenozide (Prodigy) Corteva	18	Insect Growth Regulator		P		Controls a range of Lepidopteran pests. Registrations and permits to control Lepidoptera pests in various vegetables including fruiting vegetables and lettuce.	VL Bee:VL	R4
Tebufenozide (Mimic) Corteva	18	Ingestion / IGR		P		Registered for control of various lepidopteran pests in apples, pears, citrus, grapevines, avocado, custard apple, kiwifruit, longan, lychee, macadamia and eucalyptus.	L Bee:L	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
<p>Liriomyza Leafminers: Beet Leafminer (<i>Liriomyza chenopodii</i>) Vegetable Leafminer (<i>Liriomyza sativae</i>) Serpentine Leafminer (<i>Liriomyza huidobrensis</i>) Priority: Moderate</p> <p>Liriomyza Leafminers are ranked as a moderate priority. Dipteran Leafminers (<i>Liriomyza</i> spp.) are recent arrivals to Australia which can cause widespread damage to a range of crops. The larvae tunnel through leaf tissue, leading to reduced photosynthesis, leaf death or premature leaf death. They can cause significant economic loss through reduced yields when uncontrolled.</p>								
Abamectin PER96841	6	Ingestion	14 NG	A	ALL (excl. VIC)	Permitted in root & tuber vegetables for suppression of Leafminers (<i>Liriomyza</i> spp.), including Vegetable Leafminer (<i>Liriomyza sativa</i>) and Serpentine Leafminer (<i>Liriomyza huidobrensis</i>). Apply as a foliar spray when leafminers first appear. Use a retreatment interval of 7-14 days. Maximum of 2 applications per crop.	M Bee:H	R3
Cyromazine (Diptex 150 WP) PER81867	17	IGR	7 NG	A	ALL	Permitted in root & tuber vegetables for control of Liriomyza species, including Vegetable Leafminer (<i>Liriomyza sativa</i>) and Serpentine Leafminer (<i>Liriomyza huidobrensis</i>). Apply as a foliar spray, commencing when leafminers first appear. Use a minimum retreatment interval of 7 days. Maximum of 6 applications per crop.	-	R4
Spinetoram (Success Neo) Corteva PER94451	5	Ingestion	3	A	ALL (excl. VIC)	Permitted in root and tuber vegetables for control of Liriomyza Leafminers , including Vegetable Leafminer (<i>Liriomyza sativa</i>), Pea Leafminer / Serpentine Leafminer (<i>Liriomyza huidobrensis</i>) & American Serpentine Leafminer (<i>Liriomyza trifolii</i>). Apply as a foliar spray, commencing when leafminers first appear. Use a retreatment interval of 7-14 days. Maximum of 4 applications per crop.	M Bee:H	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinosad (Entrust Organic) Corteva PER94331	5	Ingestion	3 G:14	A	ALL (excl. VIC)	Permitted in root & tuber vegetables, including beetroot, for control of <i>Liriomyza</i> Leafminers, including Vegetable Leafminer (<i>Liriomyza sativa</i>), Pea Leafminer / Serpentine Leafminer (<i>Liriomyza huidobrensis</i>) & American Serpentine Leafminer (<i>Liriomyza trifolii</i>). Apply as a foliar spray, commencing when leafminers first appear. Use a minimum retreatment interval of 5 days. Maximum of 4 applications per crop, with no more than 2 consecutive applications.	L Bee:L	R4
Chlorantraniliprole (Coragen) FMC	28	Ingestion		P		Permitted for control of Liriomyza Leafminers in spinach and silverbeet.	L Bee:VL	R4
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 NG	P-A	ALL	Registered in root and tuber vegetables including beetroot for control of Diamondback Moth, Cabbage White Butterfly, Heliothis, Cluster Caterpillar and Loopers. Permitted for control of Liriomyza species, including Vegetable Leafminer (<i>Liriomyza sativae</i>) in brassica vegetables.	M Bee:H	R3
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Permitted for use in bulb vegetables, fruiting vegetables (all) and potatoes for control of Liriomyza species, including Vegetable Leafminer (<i>Liriomyza sativae</i>), Pea Leafminer/Serpentine Leafminer (<i>Liriomyza huidobrensis</i>) and American Serpentine Leafminer (<i>Liriomyza trifolii</i>).	M Bee:VH	R4
Isocycloseram (Simodis Plinazolin) Syngenta	30	Ingestion		P		Permitted for control of Liriomyza Leafminers in celery, baby leaf spinach, baby leaf lettuce, kale, open leaf lettuce, parsley, coriander, shallots, leek, tomato and capsicum.	H Bee:H	R4
Spirotetramat (Movento) Bayer	23	Ingestion		P		Permitted for control of Liriomyza Leafminers in snow peas, sugar snap peas, lettuce, parsley, eggplant, capsicums, chillies, tomatoes, green beans, celery and rhubarb.	M Bee:VL	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Cluster Caterpillar (<i>Spodoptera litura</i>)								
Priority: Moderate								
Cluster Caterpillar is ranked as a moderate priority. Larvae feed on the leaf surface and can cause extensive leaf loss when the pest is in large numbers.								
<i>Bacillus thuringiensis subsp. kurstaki</i> (DiPel)	11A	Biological	NR	A	ALL	Registered in vegetables for control of Lepidoptera. Time spraying to coincide with egg hatch. Treatments per season not limited.	VL Bee:VL	R4
Carbaryl	1A	Contact	3	A	ALL	Registered in root vegetables – beetroot for control of Brown Vegetable Weevil, Wingless Grasshopper, Green Vegetable Bug, Heliothis, Leaf Eating Ladybird, Cutworms, European Earwig, Potato Moth, Rutherglen Bug and Armyworm . Apply as a foliar spray at first sign of pest activity. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R4
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 NG	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Diamondback Moth, Cabbage White Butterfly, Heliothis, Cluster Caterpillar and Loopers. Apply as a foliar spray at first signs of pest infestation. Use a minimum retreatment interval of 7 days. Maximum of 4 applications per crop.	M Bee:H	R3
Flubendiamide (Belt) Bayer	28	Ingestion	1	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Diamondback Moth (<i>Plutella xylostella</i>), Cabbage White Butterfly (<i>Pieris rapae</i>), Cluster Caterpillar (<i>Spodoptera litura</i>), Potato Moth (<i>Phthorimaea operculella</i>) and Heliothis (<i>Helicoverpa</i> spp.) Apply as a foliar spray when monitoring indicates pest thresholds have been reached. Use a retreatment interval of 7-14 days. Maximum of 3 applications per crop.	L-M Bee:L	R4
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 foliar spray when pest is evident. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	VH Bee:H	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Methomyl PER82428	1A	Contact	7	A	ALL	Permitted for use in beetroot for control of <i>Helicoverpa</i> spp. Cucumber Moth, Cluster Caterpillar , Loopers, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. Apply as a foliar spray when monitoring identifies early stages of a pest incursion. Use a retreatment interval of 7 days. Maximum of 3 applications per crop.	H Bee:H	R2
Spinetoram (Success Neo) Corteva	5	Ingestion	3	P-A	ALL	Registered in root and tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers, Helicoverpa and Potato Moth. Registered for control of Cluster Caterpillar in brassica vegetables.	M Bee:H	R4
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	P-A	ALL	Registered in root & tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers, Helicoverpa and Potato Moth. Registered for control of Cluster Caterpillar in brassica vegetables.	L Bee:L	R4
Chlorantraniliprole (Coragen) FMC	28	Ingestion		P		Registered for control of Spodoptera spp. in brassica vegetables, brassica leafy vegetables and strawberries.	L Bee:VL	R4
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered for control of a broad range of Lepidopteran pests in various vegetables crops.	L Bee:H	R3
Methoxyfenozide (Prodigy) Corteva	18	Insect Growth Regulator		P		Controls a range of Lepidopteran pests. Registrations and permits to control Lepidoptera pests in various vegetables including fruiting vegetables and lettuce.	VL Bee:VL	R4
Tebufenozide (Mimic) Corteva	18	Ingestion / IGR		P		Registered for control of various lepidopteran pests in apples, pears, citrus, grapevines, avocado, custard apple, kiwifruit, longan, lychee, macadamia and eucalyptus.	L Bee:L	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Jassids / Leafhoppers (Cicadellidae)								
Priority: Moderate								
Jassids are ranked as a moderate priority. Jassids are a sap sucking insect that can damage crops in both adult and nymph stages, causing wilting, stunting and distortion of plants. Sooty mould may grow on honey dew after heavy infestations.								
Dimethoate	1B	Contact	14	A	ALL	Registered in beetroot for control of Aphids, Jassids , Mites, Leafhoppers , Green Vegetable Bug, Thrips and Wingless Grasshopper. Apply as a foliar spray when pests appear. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R3
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 foliar spray when pest is evident. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	VH Bee:H	R4
Petroleum Oil	UN	Contact	NR	A	ALL	Registered in beet for control of Aphids, Mites, Thrips and Leafhopper . Apply as a foliar spray as needed. Retreatment interval and maximum number of applications per crop not specified.	VL Bee:L	R4
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	P-A	ALL	Registered in root and tuber vegetables for control of Green Peach Aphid, and suppression of Tomato Potato Psyllid and Rutherglen Bug. US registration for control of Leafhoppers in berries, pome fruit and root and tuber vegetables.	M Bee:VH	R4
Buprofezin (Applaud) Corteva	16	Ingestion		P		Registered for control of Jassids in citrus.	L Bee:VL	R4
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of Leafhoppers in tropical & subtropical fruit (inedible peel).	L Bee:VL	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Crickets (Gryllotalpidae)								
Priority: Moderate								
Crickets are ranked as a moderate priority. They do not cause impacts in all regions. Crickets only cause problems on new ground in Tasmania. They have a voracious appetite and can cause severe damage to foliage to young crops when numbers are high. Damage is limited to feeding on newly established plants and reducing plant populations. Bait sampling prior to planting should be used to determine the presence of soil pests in beetroot. Clean fallows (free from weeds) generally cause pest insect numbers to decline due to a lack of food.								
Broflanilide (Cimegra) BASF	30	Contact & Ingestion		P		Registered in brassica vegetables and Chinese cabbage for control of Diamondback Moth. Broad spectrum activity on soil-dwelling pests although specific effect on crickets is currently unknown.	H Bee:VH	R4
Fipronil (Regent)	2B	Contact		P		Registered for control of Mole Crickets in potatoes.	M Bee:H	R2
Imidacloprid	4A	Contact & Ingestion		P		Registered as a seed treatment for control of Field Cricket in maize, sorghum, sunflower and sweet corn.	M Bee:M	R2
Wireworms (Tenebrionidae)								
Priority: Moderate								
Wireworms are ranked as a moderate priority. Larvae attack germinating seeds, the hypocotyl, roots and at the surface of young plants resulting in seedling death and patchy plant stands. The adult beetles can also damage seedlings by chewing at or just above ground level. Bait sampling prior to planting should be used to determine the presence of soil pests in beetroot. Clean fallows (free from weeds) generally cause pest insect numbers to decline due to a lack of food. Infestations of wireworm larvae detected after crop emergence cannot be controlled with baiting or surface spraying. Therefore, this pest must be detected before planting for control actions to be effective.								
1,3-Dichloropropene + Chloropicrin + (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of plant parasitic Nematodes, Symphytans, Wireworms , soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) and suppression of weeds. Restricted chemical. For use by professional and registered fumigators only.	-	R4
Broflanilide (Cimegra) BASF	30	Contact & Ingestion		P		Registered in brassica vegetables and Chinese cabbage for control of Diamondback Moth. Broad spectrum activity on soil-dwelling pests including Wireworm .	H Bee:VH	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Clothianidin + Imidacloprid (Poncho Plus) BASF	4A	Contact & Ingestion		P		Registered as a seed treatment for control of Wireworm in canola, forage brassicas, maize, sweet corn, sorghum and sunflower.	M Bee:M	R2
Fipronil (Regent)	2B	Contact		P		Registered as a broadcast spray to the soil surface and incorporated prior to planting for control of Wireworm in potatoes, sweet potatoes and sugarcane.	M Bee:H	R2
Beet Cyst Nematode (<i>Heterodera schachtii</i>) Priority: Moderate								
Beet Cyst Nematode is ranked as a moderate priority. They do not cause impacts in all regions. Beet Cyst Nematodes only cause problems on new ground in Tasmania. They are microscopic, worm-like animals that can invade plant roots near the root tip. Affected plants have an unthrifty appearance and often show symptoms of stunting, wilting or chlorosis. Symptoms are most severe in young plants. Management options include nematicides, soil fumigation and crop rotation.								
1,3-Dichloropropene + Chloropicrin + (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of plant parasitic Nematodes , Symphylans, Wireworms, soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) and suppression of weeds. Restricted chemical. For use by professional and registered fumigators only.	-	R4
Dazomet (Basamid)	8F	Soil Fumigant	NR	A	ALL	Registered as a pre-plant fumigant in seed beds for control of Soil fungi, Nematodes , soil insects and weeds. Apply granules to the soil surface and incorporate and seal the soil surface immediately. Do not plant into soil until a positive germination test has been conducted.	-	R4
Metham Sodium	-	Fumigant	NR	A	ALL	Registered in food crops as a pre-plant fumigant for control of Plant Parasitic Nematodes , weed seeds, and various fungal diseases. Applied as a soil injection, soil surface spray in front of a rotary tiller or through approved trickle irrigation systems.	-	R4
Fluazaindolizine (Salibro Reklemel) Corteva	N-UN	Contact	NR	P-A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Root Knot Nematode (<i>Meloidogyne</i> spp.)	L Bee:L	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Fluopyram (Velum Prime) Bayer	N-3	Contact	NR	P-A	ALL	Registered for control of Root Knot Nematode (<i>Meloidogyne</i> spp.) and Root Lesion Nematode (<i>Pratylenchus</i> spp.) in root & tuber vegetables.	L Bee:L	R4
Abamectin (Tervigo) Syngenta	N-2	Contact		P		Registered for control of Root-Knot Nematode in peppers, chillis, cucurbits, eggplant and tomatoes.	M Bee:H	R3
Cadusafos (Rugby)	1B	Contact		P		Registered for control of Nematodes in banana, citrus, ginger, sugar cane, tobacco and tomato.	H Bee:H	R4
Cyclobutrifluram (Vaniva Tymirium) Syngenta	N-3	Contact		P		Registered for control of Root-Knot Nematode in fruiting vegetables and cucurbits.	L Bee:L	R4
Fenamiphos (Nemacur)	1B	Contact		P		Registered for control of Nematodes in aloe vera and bananas.	H Bee:H	R3
Fluensulfone (Nimitz) Adama	UN	Contact		P		Registered for control of Root-Knot Nematode in peppers, carrot, chilli, cucurbits, eggplant, okra, potato, sugarcane, sweet potato and tomato.	L Bee:L	R4
Oxamyl (Vydate) Corteva	1A	Contact		P		Registered for control of Nematodes in bananas, capsicum, tomatoes and sweet potatoes.	H Bee:H	R4
Terbufos (Counter)	1B	Contact		P		Registered for control of Burrowing Nematode and Spiral Nematode in bananas.	H Bee:H	R3
<p>Symphilids (<i>Scutigerella immaculata</i>) Priority: Moderate</p> <p>Symphilids are ranked as a moderate priority. Symphilids are small, soil-inhabiting arthropods that resemble centipedes. They feed on the root hairs of plants and can also tunnel into the roots and stems leading to stunting and plant loss. Plants will be weakened or killed if numbers are high, leading to poor crop establishment.</p>								
1,3-Dichloropropene + Chloropicrin + (Telone C-35)	8B	Soil Fumigant	NR	A	ALL	Registered in vegetables for control of plant parasitic Nematodes, Symphylans , Wireworms, soil borne diseases (including <i>Fusarium</i> and <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , <i>Pythium</i>) and suppression of weeds. Restricted chemical. For use by professional and registered fumigators only.	-	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Bifenthrin (Astral)	3A	Contact		P		Registered as a broadcast spray applied pre-plant and soil incorporated for control of Symphylids in pineapple.	VH Bee:H	R3
Fipronil (Regent)	2B	Contact		P		Registered for control of Symphylids in ginger.	M Bee:VH	R3
Green Peach Aphid (<i>Myzus persicae</i>) Potato Aphid (<i>Macrosiphum euphorbiae</i>) Priority: Low								
Aphids are ranked as a low priority. They are sap-sucking insects, causing loss of vigour, and in some cases yellowing, stunting or distortion of plant parts. Honeydew can cause sooty mould to develop on leaves.								
Dimethoate	1B	Contact	14	A	ALL	Registered in beetroot for control of Aphids , Jassids, Mites, Leafhoppers, Green Vegetable Bug, Thrips and Wingless Grasshopper. Apply as a foliar spray when pests appear. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R3
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 foliar spray when pest is evident. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	VH Bee:H	R4
Imidacloprid PER81260	4A	Contact & Ingestion	3	A	ALL (excl. VIC)	Permitted for use in beetroot for control of Aphids (<i>Aphidae</i> spp.) and Thrips (<i>Thysanoptera</i> spp.), excluding Western Flower Thrips. Apply as a foliar spray at first sign of infestation. Retreatment interval not specified. Maximum of 2 applications per crop.	M Bee:M	R2
Petroleum Oil	UN	Contact	NR	A	ALL	Registered in beet for control of Aphids , Mites, Thrips and Leafhopper. Apply as a foliar spray as needed. Retreatment interval and maximum number of applications per crop not specified.	VL Bee:L	R4
Pirimicarb (Aphidex)	1A	Contact & Ingestion	2	A	ALL	Registered in beetroot for control of Green Peach Aphid . Apply as a foliar spray as needed. Retreatment interval not specified. Maximum of 2 non-consecutive applications per crop.	VL Bee:VL	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Potassium Salts of Fatty Acids (Natrasoap)	-	Contact	NR	A	ALL	Registered in vegetables for control of Aphids , Thrips, Mealybug, Two Spotted Mites, Spider Mite and Whitefly. Apply as a foliar spray as need. Use a retreatment interval of 5-7 days. Maximum number of applications per crop not specified.	L Bee:L	R4
Pymetrozine (Chess) Syngenta	9B	Contact & Ingestion	14	A	ALL	Registered in beetroot for control of Potato Aphid and Green Peach Aphid . Apply as a foliar spray when monitoring indicates pest threshold has been reached. Use a minimum retreatment interval of 14 days. Maximum of 2 applications per crop.	L Bee:VL	R3
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in root and tuber vegetables for control of Green Peach Aphid , and suppression of Tomato Potato Psyllid and Rutherglen Bug. Apply as a foliar spray when pest is present. Use a retreatment interval of 7-10 days. Maximum of 4 applications per crop, with no more than 2 consecutive applications.	M Bee:VH	R4
Afidopyropen (Versys) BASF	9D	Ingestion		P		Registered for the control of Green Peach Aphid in sweet corn, rhubarb, artichoke, brassica vegetables, celery, cucurbits, fruiting vegetables, strawberry, leafy vegetables and brassica leafy vegetables.	L Bee:L	R4
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Registered for suppression of Green Peach Aphid in fruiting vegetables and potatoes, and control of Green Peach Aphid in strawberries.	M Bee:VH	R4
Dimpropridaz (Efficon) BASF	UN	Ingestion		P		Registered for the control of Green Peach Aphid in brassica vegetables, leafy vegetables and brassica leafy vegetables.	M Bee:L	R4
Fonicamid (Mainman) UPL	9C	Ingestion		P		Registered for control of Green Peach Aphid in canola, cucurbits and Green Peach Aphid and Potato Aphid in potato.	M Bee:L	R4
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of Green Peach Aphid in cucurbits, eggplant, peppers, tomatoes, green beans, potatoes and sweet potatoes.	L Bee:VL	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of Green Peach Aphid in beans, peas, brassica vegetables, brassica leafy vegetables, celery, rhubarb, cucurbits, eggplant, peppers, tomatoes, herbs, leafy vegetables, lettuce, chicory, endive, radicchio, potatoes and sweet potatoes.	M Bee:VL	R4
Cotton Bollworm / Corn Earworm (<i>Helicoverpa armigera</i>) Native Budworm (<i>Helicoverpa punctigera</i>) Priority: Low Helicoverpa is ranked as a low priority. <i>Helicoverpa armigera</i> is generally regarded as the more serious pest because of its greater capacity to develop resistance to insecticides, broader host range, and persistence in cropping areas from year to year. Larvae feed on leaves but are most damaging when feeding on growing terminals, buds, flowers & fruit.								
<i>Bacillus thuringiensis subsp. kurstaki</i> (DiPel)	11A	Biological	NR	A	ALL	Registered in vegetables for control of Lepidoptera. Time spraying to coincide with egg hatch. Treatments per season not limited.	VL Bee:VL	R4
Carbaryl	1A	Contact	3	A	ALL	Registered in root vegetables – beetroot for control of Brown Vegetable Weevil, Wingless Grasshopper, Green Vegetable Bug, Heliothis , Leaf Eating Ladybird, Cutworms, European Earwig, Potato Moth, Rutherglen Bug and Armyworm. Apply as a foliar spray at first sign of pest activity. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R4
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 NG	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Diamondback Moth, Cabbage White Butterfly, Heliothis , Cluster Caterpillar and Loopers. Apply as a foliar spray at first signs of pest infestation. Use a minimum retreatment interval of 7 days. Maximum of 4 applications per crop.	M Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Flubendiamide (Belt) Bayer	28	Ingestion	1	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Diamondback Moth (<i>Plutella xylostella</i>), Cabbage White Butterfly (<i>Pieris rapae</i>), Cluster Caterpillar (<i>Spodoptera litura</i>), Potato Moth (<i>Phthorimaea operculella</i>) and Heliothis (<i>Helicoverpa</i> spp.) Apply as a foliar spray when monitoring indicates pest thresholds have been reached. Use a retreatment interval of 7-14 days. Maximum of 3 applications per crop.	L-M Bee:L	R4
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 foliar spray when pest is evident. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	VH Bee:H	R4
Methomyl PER82428	1A	Contact	7	A	ALL	Permitted for use in beetroot for control of Helicoverpa spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. Apply as a foliar spray when monitoring identifies early stages of a pest incursion. Use a retreatment interval of 7 days. Maximum of 3 applications per crop.	H Bee:H	R2
Spinetoram (Success Neo) Corteva	5	Ingestion	3	A	ALL	Registered in root and tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers, Helicoverpa and Potato Moth. Apply as a foliar spray when monitoring indicates pest thresholds have been reached. Use a retreatment interval of 7-14 days. Maximum of 4 applications per season.	M Bee:H	R4
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	A	ALL	Registered in root and tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers, Helicoverpa and Potato Moth. Apply as a foliar spray when monitoring indicates pest thresholds have been reached. Use a retreatment interval of 7-14 days. Maximum of 4 applications per season.	L Bee:L	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorantraniliprole (Coragen) FMC	28			P		Registered for control of <i>Helicoverpa spp.</i> in brassica vegetables, brassica leafy vegetables, stalk and stem vegetables, leafy vegetables, lettuce, fruiting vegetables, cucurbits, legume vegetables, potatoes, strawberries and sweet corn.	L Bee:VL	R4
<i>Clitoria ternatea</i> Extract (Sero-X) Growth Agriculture	-	Biological	NR	P		Registered for control of <i>Helicoverpa spp.</i> in cotton, lucerne and tomato.	L Bee:VL	R4
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered for control of <i>Helicoverpa spp.</i> in brassica vegetables, leafy vegetables, Chinese leafy vegetables, fruiting vegetables, celery, cucurbits, sweet corn and pome fruit.	L Bee:H	R3
Isocycloseram (Simodis Plinazolin) Syngenta	30	Ingestion		P		Registered for suppression of <i>Heliothis</i> in brassica vegetables, brassica leafy vegetables, cucurbits and fruiting vegetables.	H Bee:H	R4
Methoxyfenozide (Prodigy) Corteva	18	Insect Growth Regulator		P		Registered for control of Native Budworm in tomatoes, peppers, eggplant and okra.	VL Bee:VL	R4
<i>Helicoverpa</i> NPV (Vivus Max) AgBiTech	31	Biological		P		Registered for control of <i>Helicoverpa spp.</i> in potatoes, sweet corn, berryfruit, brassica vegetables, celery, cucurbits, fruiting vegetables, leafy vegetables, legume vegetables, ornamentals and pome fruit.	VL Bee:L	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
European Earwig (<i>Forficula auricularia</i>)								
Priority: Low								
Earwigs are ranked as a low priority. Soil pests such as earwigs can reduce plant establishment, row density and vigour. Symptoms can be confused with other establishment problems and may be worse if seedling development is slow due to climate or other factors. Earwigs, predominantly feed on germinating seed and seedling roots, resulting in poor establishment. Bait sampling prior to planting should be used to determine the presence of earwigs. The use of in-furrow insecticide treatments has been found to be generally ineffective for the protection of newly sown grain crops where dense populations are present. Clean fallows generally cause pest insect numbers to decline due to a lack of food.								
Carbaryl	1A	Contact	3	A	ALL	Registered in root vegetables – beetroot for control of Brown Vegetable Weevil, Wingless Grasshopper, Green Vegetable Bug, Heliothis, Leaf Eating Ladybird, Cutworms, European Earwig , Potato Moth, Rutherglen Bug and Armyworm. Apply as a foliar spray at first sign of pest activity. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R4
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 foliar spray when pest is evident. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	VH Bee:H	R4
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered for control of Earwigs in stone fruit and strawberries.	L Bee:H	R3
Broflanilide (Cimegra) BASF	30	Contact & Ingestion		P		Registered in brassica vegetables and Chinese cabbage for control of Diamondback Moth. Broadspectrum activity on soil-dwelling pests although specific effect on earwigs is currently unknown.	H Bee:VH	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Rutherglen Bug (<i>Nysius vinitor</i>)								
Priority: Low								
Rutherglen Bug is ranked as a low priority. They breed up on weeds adjacent to cropping areas. It is important to monitor crops for eggs and nymphs by regular field scouting. Large numbers can cause significant feeding damage to foliage by sucking the sap and depleting the crop of nutrients. Growers should anticipate potential migrations of pests from one finishing crop to another emerging one. Rutherglen Bugs can be controlled by removing the weeds they use as hosts and by ploughing a deep furrow around the emerging crop, preventing wingless nymphs from migrating from weeds or harvested crops.								
Carbaryl	1A	Contact	3	A	ALL	Registered in root vegetables – beetroot for control of Brown Vegetable Weevil, Wingless Grasshopper, Green Vegetable Bug, Heliothis, Leaf Eating Ladybird, Cutworms, European Earwig, Potato Moth, Rutherglen Bug and Armyworm. Apply as a foliar spray at first sign of pest activity. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R4
Lambda-Cyhalothrin (Karate Zeon) PER11949	3A	Contact	2	A	ALL (excl. VIC)	Permitted in beetroot for control of Onion Thrips (<i>Thrips tabaci</i>), Plague Thrips (<i>Thrips imaginis</i>), Rutherglen Bug (<i>Nysius</i> spp.) Vegetable Loopers (<i>Chrysodeixis</i> spp.) and Vegetable Weevil (<i>Listroderes difficilis</i>). Apply as a foliar spray when pest numbers reach threshold level. Use a minimum retreatment interval of 7 days. Maximum number of sprays per crop not specified, no more than 2 consecutive applications.	VH Bee:H	R4
Methomyl PER82428	1A	Contact	7	A	ALL	Permitted for use in beetroot for control of <i>Helicoverpa</i> spp. Cucumber Moth, Cluster Caterpillar, Loopers, Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. Apply as a foliar spray when monitoring identifies early stages of a pest incursion. Use a retreatment interval of 7 days. Maximum of 3 applications per crop.	H Bee:H	R2
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in root and tuber vegetables for control of Green Peach Aphid, and suppression of Tomato Potato Psyllid and Rutherglen Bug . Apply as a foliar spray when pest is present. Use a retreatment interval of 7-10 days. Maximum of 4 applications per crop, with no more than 2 consecutive applications.	M Bee:VH	R4

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 Cabbage White Butterfly, Cabbage Moth, Rutherglen Bug and Green Vegetable Bug. Apply as a foliar spray when pests are first seen. Use a retreatment interval of 7-10 days. Maximum number of applications per crop not specified.	H Bee:H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of various Hemiptera species in macadamias, tropical & subtropical fruit (inedible peel) and olives. Activity on Rutherglen Bug is unknown.	L Bee:VL	R4
Green Vegetable Bug (<i>Nezara viridula</i>)								
Priority: Low								
Green Vegetable Bug is ranked as a low priority. They are a sporadic sucking pest that will migrate into crops from shade lines and vegetation along watercourses. Symptoms include lack of crop vigour and in severe cases can lead to reduced yield.								
Carbaryl	1A	Contact	3	A	ALL	Registered in root vegetables – beetroot for control of Brown Vegetable Weevil, Wingless Grasshopper, Green Vegetable Bug , Heliothis, Leaf Eating Ladybird, Cutworms, European Earwig, Potato Moth, Rutherglen Bug and Armyworm. Apply as a foliar spray at first sign of pest activity. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R4
Dimethoate	1B	Contact	14	A	ALL	Registered in beetroot for control of Aphids, Jassids, Mites, Leafhoppers, Green Vegetable Bug , Thrips and Wingless Grasshopper. Apply as a foliar spray when pests appear. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R3
Trichlorfon (Lepidex)	1B	Contact	2	A	ALL	Registered in vegetables for control of Cabbage White Butterfly, Cabbage Moth, dimethoate and Green Vegetable Bug . Apply as a foliar spray when pests are first seen. Use a retreatment interval of 7-10 days. Maximum number of applications per crop not specified.	H Bee:H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of various Hemiptera species in macadamias, tropical & subtropical fruit (inedible peel) and olives. Activity on Green Vegetable Bug is unknown.	L Bee:VL	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Looper Caterpillar (Geometridae)								
Priority: Low								
Looper caterpillars are ranked as a low priority. The larvae are voracious leaf feeders but they do not usually inflict serious damage in beetroot. They are easily controlled by insecticides when present in large numbers.								
<i>Bacillus thuringiensis subsp. kurstaki</i> (DiPel)	11A	Biological	NR	A	ALL	Registered in vegetables for control of Lepidoptera. Time spraying to coincide with egg hatch. Treatments per season not limited.	VL Bee:VL	R4
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	3 NG	A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Diamondback Moth, Cabbage White Butterfly, Heliothis, Cluster Caterpillar and Loopers . Apply as a foliar spray at first signs of pest infestation. Use a minimum retreatment interval of 7 days. Maximum of 4 applications per crop.	M Bee:H	R3
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 foliar spray when pest is evident. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	VH Bee:H	R4
Lambda-Cyhalothrin (Karate Zeon) PER11949	3A	Contact	2	A	ALL (excl. VIC)	Permitted in beetroot for control of Onion Thrips (<i>Thrips tabaci</i>), Plague Thrips (<i>Thrips imaginis</i>), Rutherglen Bug (<i>Nysius</i> spp.) Vegetable Loopers (<i>Chrysodeixis</i> spp.) and Vegetable Weevil (<i>Listroderes difficilis</i>). Apply as a foliar spray when pest numbers reach threshold level. Use a minimum retreatment interval of 7 days. Maximum number of sprays per crop not specified, no more than 2 consecutive applications.	VH Bee:H	R4
Methomyl PER82428	1A	Contact	7	A	ALL	Permitted for use in beetroot for control of <i>Helicoverpa</i> spp. Cucumber Moth, Cluster Caterpillar, Loopers , Webworm, Rutherglen Bug and Thrips including Western Flower Thrips. Apply as a foliar spray when monitoring identifies early stages of a pest incursion. Use a retreatment interval of 7 days. Maximum of 3 applications per crop.	H Bee:H	R2

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 root and tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers , Helicoverpa and Potato Moth. Apply as a foliar spray when monitoring indicates pest thresholds have been reached. Use a retreatment interval of 7-14 days. Maximum of 4 applications per season.	M Bee:H	R4
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	A	ALL	Registered in root and tuber vegetables including beetroot for control of Light Brown Apple Moth, Loopers , Helicoverpa and Potato Moth. Apply as a foliar spray when monitoring indicates pest thresholds have been reached. Use a retreatment interval of 7-14 days. Maximum of 4 applications per season.	L Bee:L	R4
Flubendiamide (Belt) Bayer	28	Ingestion	1	P-A	ALL	Registered in root & tuber vegetables, including beetroot, for control of Diamondback Moth (<i>Plutella xylostella</i>), Cabbage White Butterfly (<i>Pieris rapae</i>), Cluster Caterpillar (<i>Spodoptera litura</i>), Potato Moth (<i>Phthorimaea operculella</i>) and Heliothis (<i>Helicoverpa</i> spp.)	L-M Bee:L	R4
Chlorantraniliprole (Coragen) FMC	28			P		Registered for control of Soybean Looper in brassica vegetables and brassica leafy vegetables.	L Bee:VL	R4
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered for control of Soybean Looper in fruiting vegetables.	L Bee:H	R3
Methoxyfenozide (Prodigy) Corteva	18	Insect Growth Regulator		P		Registered for control of Loopers in pome fruit.	VL Bee:VL	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Two Spotted Mite (<i>Tetranychus urticae</i>)								
Priority: Low								
Two Spotted Mite is ranked as a low priority. Mites feed on aerial parts of the plant and tend to shelter on the underside of leaves. Severe infestations will cause reddening of leaves and can lead to leaf drop and reduced crop vigour in patches.								
Dimethoate	1B	Contact	14	A	ALL	Registered in beetroot for control of Aphids, Jassids, Mites , Leafhoppers, Green Vegetable Bug, Thrips and Wingless Grasshopper. Apply as a foliar spray when pests appear. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R3
Petroleum Oil	UN	Contact	NR	A	ALL	Registered in beet for control of Aphids, Mites , Thrips and Leafhopper. Apply as a foliar spray as needed. Retreatment interval and maximum number of applications per crop not specified.	VL Bee:L	R4
Potassium Salts of Fatty Acids (Natrasoap)	-	Contact	NR	A	ALL	Registered in vegetables for control of Aphids, Thrips, Mealybug, Two Spotted Mites , Spider Mite and Whitefly. Apply as a foliar spray as need. Use a retreatment interval of 5-7 days. Maximum number of applications per crop not specified.	L Bee:L	R4
Propargite (Omite)	12C	Contact	7	A	ALL	Registered in vegetables for control of Two-Spotted Mites and Spider Mites. Apply as a foliar spray when pests appear. Retreatment interval and maximum number of applications per crop not specified.	M Bee:L	R3
Sulphur	UN	Contact	NR	A	ALL	Registered in vegetables for control of Mites . Apply as a foliar spray when pest is first seen. Use a retreatment interval of 14-21 days. Maximum number of applications per crop not specified.	-	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Abamectin PER96841	6	Ingestion	14 NG	P-A	ALL (excl. VIC)	Permitted in root & tuber vegetables for suppression of Leafminers (<i>Liriomyza</i> spp.), including Vegetable Leafminer (<i>Liriomyza sativa</i>) and Serpentine Leafminer (<i>Liriomyza huidobrensis</i>). Registered for control of Two-Spotted Mite in pome fruit, berries, cotton, cucumber, squash, zucchini, spring onions, shallots, snow peas, sugar snap peas, sweet corn, fruiting vegetables, custard apple, hops, lettuce, lychee, ornamentals, papaya, passionfruit and strawberries.	M Bee:H	R3
Acequinocyl (Kanemite) UPL	20B	Contact & Ingestion		P		Registered for control of Two-Spotted Mite in pome fruit and stone fruit.	L Bee:L	R4
Bifenazate (Acramite) UPL	20D	Contact & Ingestion		P		Registered for control of various mites in almonds, pome fruit, stone fruit, cucurbits, eggplant, pawpaw, pepper, strawberries and tomatoes.	L Bee:H	R4
Cyflumetofen (Danisaraba) BASF	25A	Contact		P		Registered for control of Two Spotted Mite (<i>Tetranychus urticae</i>) in pome fruit, almond, citrus, grapes, strawberries, fruiting vegetables and ornamentals.	L Bee:L	R4
Etoxazole (Paramite) Sumitomo	10B	Contact		P		Registered for control of Two-Spotted Mites in pome fruit, stone fruit, almonds and grapes.	L Bee:VL	R4
Isocycloseram (Simodis Plinazolin) Syngenta	30	Ingestion		P		Registered for control of Two Spotted Mite in cucurbits and fruiting vegetables.	H Bee:H	R4
Orange Oil (Prev-Am) Oro Agri	-	Contact		P		Registered for control of Two Spotted Mite in fruiting vegetables, cucurbits, legume vegetables, berries, apples, citrus and pawpaw.	VL Bee:VL	R4
Spiromesifen (Interrupt) Bayer	23	Ingestion		P		Registered for control of Two Spotted Mite in pome fruit and stone fruit.	M Bee:VL	R4

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Vegetable Weevil (<i>Listroderes difficilis</i>)								
Priority: Low								
Weevils are ranked as a low priority. They are a sporadic pest that can cause damage by tunnelling into leaves and reducing plant vigour. They rarely require control measures in beetroot.								
Carbaryl	1A	Contact	3	A	ALL	Registered in root vegetables – beetroot for control of Brown Vegetable Weevil , Wingless Grasshopper, Green Vegetable Bug, Heliothis, Leaf Eating Ladybird, Cutworms, European Earwig, Potato Moth, Rutherglen Bug and Armyworm. Apply as a foliar spray at first sign of pest activity. Retreatment interval and maximum number of applications per crop not specified.	H Bee:H	R4
Lambda-Cyhalothrin (Karate Zeon) PER11949	3A	Contact	2	A	ALL (excl. VIC)	Permitted in beetroot for control of Onion Thrips (<i>Thrips tabaci</i>), Plague Thrips (<i>Thrips imaginis</i>), Rutherglen Bug (<i>Nysius</i> spp.) Vegetable Loopers (<i>Chrysodeixis</i> spp.) and Vegetable Weevil (<i>Listroderes difficilis</i>). Apply as a foliar spray when pest numbers reach threshold level. Use a minimum retreatment interval of 7 days. Maximum number of sprays per crop not specified, no more than 2 consecutive applications.	VH Bee:H	R4
Indoxacarb (Avatar eVo) FMC	22A	Ingestion		P		Registered for control of Weevils in pome fruit and stone fruit.	L Bee:H	R3
Tetraniliprole (Vayego) Bayer	28	Ingestion		P		Registered for control of Sigastus Weevil in macadamia and control of Apple Weevil, Fuller's Rose Weevil and Garden Weevil in pome fruit and stone fruit.	M Bee:VH	R4

4.3 Weeds in Beetroot

4.3.1 Weed priorities

Common Name	Scientific Name
High	
Annual Ryegrass	<i>Lolium rigidum</i>
Wild Radish	<i>Raphanus raphanistrum</i>
Feathertop Rhodes Grass	<i>Chloris virgata</i>
Wireweed	<i>Polygonum aviculare</i>
Red-Root Amaranth	<i>Amaranthus retroflexus</i>
Stinging Nettle	<i>Urtica</i> spp.
Moderate	
Wild Turnip	<i>Brassica tournefortii</i>
Common Sowthistle	<i>Sonchus oleraceus</i>
Fat Hen	<i>Chenopodium album</i>
Marshmallow	<i>Malva parviflora</i>
Low	
Caltrop	<i>Tribulus terrestris</i>
Chickweed	<i>Stellaria media</i>
Nutgrass	<i>Cyperus rotundus</i>
Potato Weed	<i>Galinsoga</i> spp.
Shepherd's Purse	<i>Capsella bursa-pastoris</i>

The high priority weed issues based on the feedback received were Annual Ryegrass, Wild Radish, Feathertop Rhodes Grass, Wireweed, Red-Root Amaranth and Sting Nettle. Herbicide options are listed in Appendix 3 which can be used in conjunction with various management practices such as soil fumigation, pre-crop spraying, spot spraying and mechanical controls.

Growers generally use a pre-plant weed control including broad spectrum knockdown herbicides and cultivation to prepare the field. Starting with a weed-free seed bed at planting is a key strategy to reduce the abundance of weeds in crop.

There are limited in-crop herbicide options available, and it is important to rotate modes of action or use them in combination to prevent the onset of herbicide resistance.

Resistance management

Specific resistance management strategies for high resistance risk (Groups 1 and 2) and moderate resistance risk (Groups 0, 3, 4, 5, 6, 9, 10, 12, 13, 14, 15, 22, 27, 31 and 34) herbicide modes of action are available on the CroLife Australia webpage⁸.

⁸ <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			
A	Available via either registration or permit approval		
P	Potential – a possible candidate to pursue for registration or permit		
P-A	Potential, already approved in the crop for another use		
Resistance risk		Regulatory risk (refer to Appendix 6)	
***	High resistance risk	R1	Short-term risk: Critical concern over retaining access < 1 year
		R2	Medium-term risk: Maintaining access of significant concern <2-5 years
**	Moderate resistance risk	R3	Long-term: Potential issues associated with use - Monitoring required < 5 years
		R4	No current risk / concerns
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

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Annual Ryegrass (<i>Lolium rigidum</i>)							
Priority: High							
Annual Ryegrass is ranked as a high priority. Annual Ryegrass is the most serious grass weed of southern Australia with distribution that is gradually extending north. Populations 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.							
Clethodim (Select)	1***	Beetroot / Post-Emergent	Registered in beetroot for control of grass weeds, including Annual Ryegrass . Apply post-emergent to small, actively growing weeds. Maximum of 1 application per crop.	7	A	ALL	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Quizalofop-P-Ethyl	1***	Beetroot / Post Emergent	Registered in beetroot for control of grass weeds, including Annual Ryegrass . Apply to weeds that are young and actively growing. Retreatment interval and maximum number of applications per crop not specified.	14	A	ALL	R4
Sethoxydim (Sertin)	1***	Red Beet / Post-Emergent	Registered in red beet for control of grass weeds, including Annual Ryegrass . Apply when the majority of weeds are in the 2-6 leaf stage and are actively growing. Retreatment interval and maximum number of applications per crop not specified.	28	A	ALL	R4
Aclonifen (Emerger) Bayer	32**		Bayer is expected to seek registration for pre-emergent control of grass and broadleaf weeds in various crops. Registered in Europe for use in potatoes, legume vegetables and cereals.		P		R4
Amitrole	34**		Registered for control of Annual Ryegrass in fallow and potatoes.		P		R4
Dimethenamid-P (Outlook)	15**		Registered for pre-emergent control of grass and broadleaf weeds in sweet corn, beans, peas, pumpkins and kabocha.		P		R4
Napropamide (Devrinol)	0**		Registered for control of Annual Ryegrass in almonds, grapevines, stone fruit, tomatoes and canola.		P		R4
Nonanoic Acid (Beloukha)	-		Registered for control of Annual Ryegrass in non-crop areas, turf, orchards & vineyards, fallow and forestry.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Wild Radish (<i>Raphanus raphanistrum</i>) Priority: High							
Wild Radish is ranked as a high priority. Wild Radish populations 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.							
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Registered in red beet for control of grass and broadleaf weeds, including Wild Radish . Apply at sowing, or as soon as possible after planting, before crop emerges.	NR	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Wild Radish . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Wild Radish . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL (excl. QLD)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Wild Radish . Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4
Flumioxazin (Chateau) Sumitomo	14**		Registered for control of Wild Radish in grapes, pome fruit, stone fruit, citrus, nut trees, olives, avocados and berries.		P		R4
Norflurazon (Zoliar) AgNova	12**		Registered for control of Wild Radish in citrus, grapes, almonds, pome fruit and stone fruit.		P		R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4
Feathertop Rhodes Grass (<i>Chloris virgata</i>)							
Priority: High							
Feathertop Rhodes Grass is ranked as a high priority, although it is not a priority in Tasmania. Feathertop Rhodes Grass is an aggressive grass weed that is difficult to control with herbicides. Multiple applications are required.							
Clethodim (Select)	1***	Beetroot / Post-Emergent	Registered in beetroot for control of grass weeds, including Feathertop Rhodes Grass . Apply post-emergent to small, actively growing weeds. Maximum of 1 application per crop.	7	A	ALL	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Aclonifen (Emerger) Bayer	32**		Bayer is expected to seek registration for pre-emergent control of grass and broadleaf weeds in various crops. Registered in Europe for use in potatoes, legume vegetables and cereals.		P		R4
Dimethenamid-P (Outlook)	15**		Registered for pre-emergent control of grass and broadleaf weeds in sweet corn, beans, peas, pumpkins and kabocho.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Wireweed (<i>Polygonum aviculare</i>) Priority: High							
Wireweed is ranked as a high priority. Wireweed needs a period of low soil temperature to germinate, but its long taproot allows it to persist through hot, dry weather. It grows rapidly in the warmer months and is difficult to control with herbicides. Application timing is critical to ensure small weeds are targeted.							
Ethofumesate (Tramat)	15**	Beet Crops / Pre-Emergent	Registered in beet crops for control of grass and broadleaf weeds, including Wireweed . Apply before weeds or crop emerge, either pre- or post-sowing.	NR	A	ALL (excl. WA)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Wireweed , as a tank mix with ethofusemate. Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4
Metamitron	5**		Metamitron is not registered in Australia. NZ registration for control of grass and broadleaf weeds, including Wireweed , in fodder beet, red beet (beetroot), sugar beet and mangolds.		P		R4
Norflurazon (Zoliar) AgNova	12**		Registered for control of grass and broadleaf weeds including Wireweed in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Wireweed in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Red-Root Amaranth (<i>Amaranthus retroflexus</i>) Priority: High							
Red-Root Amaranth is ranked as a high priority. It is a short-lived, summer-growing annual broadleaf weed that is a prolific seed producer. Herbicide control can be effective but application timing is critical to ensure small weeds are targeted.							
Ethofumesate (Tramat)	15**	Beet Crops / Pre-Emergent	Registered in beet crops for control of grass and broadleaf weeds, including Redshank . Apply before weeds or crop emerge, either pre- or post-sowing.	NR	A	ALL (excl. WA)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Redshank . Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4
Clomazone	13**		Registered for control of broadleaf weeds including suppression of Amaranthus in beans, poppies, potato and tobacco transplants.		P		R4
Glufosinate-Ammonium (Basta) BASF	10**		Registered for control of grass and broadleaf weeds including Amaranthus in berries, tomatoes, beans and fallow.		P		R3
Metamitron	5**		Metamitron is not registered in Australia. NZ registration for control of grass and broadleaf weeds, including Amaranth , in fodder beet, red beet (beetroot), sugar beet and mangolds.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Stinging Nettle (<i>Urtica</i> spp.) Priority: High							
Stinging Nettle is ranked as a high priority. It is a soft herb whose leaves are sparsely covered with rigid, stinging hairs. Herbicide control options are limited.							
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Metamitron	5**		Metamitron is not registered in Australia. NZ registration for control of grass and broadleaf weeds, including Nettles , in fodder beet, red beet (beetroot), sugar beet and mangolds.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Stinging Nettle in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including Stinging Nettle in Brassica vegetables and beans.		P		R4
Wild Turnip (<i>Brassica tournefortii</i>) Priority: Moderate							
Wild Turnip is ranked as a moderate priority. It is a winter growing annual broadleaf that competes aggressively with crops and runs to seed quickly. Timely herbicide control can be effective provided that weeds are targeted when they are young and actively growing.							
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Norflurazon (Zoliar) AgNova	12**		Registered for control of grass and broadleaf weeds including Wild Turnip in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4
Common Sowthistle (<i>Sonchus oleraceus</i>)							
Priority: Moderate							
Common Sowthistle is ranked as a moderate priority. Sowthistle is prolific and widespread in all regions, and it is also prone to development of herbicide resistance. Timely herbicide control can be effective provided that weeds are targeted when they are young and actively growing.							
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Registered in red beet for control of grass and broadleaf weeds, including Sowthistle . Apply at sowing, or as soon as possible after planting, before crop emerges.	NR	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Sowthistle . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Sowthistle . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL (excl. QLD)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post- Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Sowthistle . Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4
Amitrole	34**		Registered for control of Sowthistle in fallow.		P		R4
Glufosinate- Ammonium (Basta) BASF	10**		Registered for control of grass and broadleaf weeds including Sowthistle in berries, tomatoes, beans and fallow.		P		R3
Isoxaben (Gallery) Corteva	29**		Registered for control of Sowthistle in non-crop, forests, fencelines, tree fruit & nut orchards, vineyards, nursery & amenity tree plantings.		P		R4
Metamitron	5**		Metamitron is not registered in Australia. NZ registration for control of grass and broadleaf weeds, including Sowthistle , in fodder beet, red beet (beetroot), sugar beet and mangolds.		P		R4
Napropamide (Devrinol)	0**		Registered for control of Sowthistle in almonds, grapevines, stone fruit, tomatoes and canola.		P		R4
Nonanoic Acid (Beloukha)	-		Registered for control of Sowthistle in non-crop areas, turf, orchards & vineyards, fallow and forestry.		P		R4
Norflurazon (Zoliar) AgNova	12**		Registered for control of grass and broadleaf weeds including Sowthistle in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Sowthistle in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Fat Hen (<i>Portulaca oleracea</i>) Priority: Moderate							
Fat Hen is ranked as a moderate priority. It is a fast-growing, annual broadleaf weed that germinates from spring to autumn. Herbicide control can be difficult and targeting weeds at early growth stages is critical.							
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Registered in red beet for control of grass and broadleaf weeds, including Fat Hen . Apply at sowing, or as soon as possible after planting, before crop emerges.	NR	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Fat Hen . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Fat Hen . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL (excl. QLD)	R4
Ethofumesate (Tramat)	15**	Beet Crops / Pre-Emergent	Registered in beet crops for control of grass and broadleaf weeds, including Fat Hen . Apply before weeds or crop emerge, either pre- or post-sowing.	NR	A	ALL (excl. WA)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Fat Hen . Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Aclonifen (Emerger) Bayer	32**	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		R4
Clomazone	13**		Registered for control of broadleaf weeds including Fat Hen in beans, poppies, potato and tobacco transplants.		P		R4
Glufosinate- Ammonium (Basta) BASF	10**		Registered for control of grass and broadleaf weeds including Fat Hen in berries, tomatoes, beans and fallow.		P		R3
Metamitron	5**		Metamitron is not registered in Australia. NZ registration for control of grass and broadleaf weeds, including Fat Hen , in fodder beet, red beet (beetroot), sugar beet and mangolds.		P		R4
Norflurazon (Zoliar) AgNova	12**		Registered for control of grass and broadleaf weeds including Fat Hen in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Fat Hen in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4
Marshmallow (<i>Malva parviflora</i>)							
Priority: Moderate							
Marshmallow is ranked as a moderate priority. It is adapted to a wide variety of environments and highly competitive weed. Control with knockdown herbicides can be unreliable.							
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Registered in red beet for control of grass and broadleaf weeds, including Marshmallow . Apply at sowing, or as soon as possible after planting, before crop emerges.	NR	A	ALL	R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Marshmallow . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Marshmallow . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL (excl. QLD)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Flumioxazin (Chateau) Sumitomo	14**		Registered for control of Marshmallow in grapes, pome fruit, stone fruit, citrus, nut trees, olives, avocados and berries.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Small Flowered Mallow in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4
Caltrop (Tribulus terrestris)							
Priority: Low							
Caltrop is ranked as a low priority. It is a flat, sprawling, summer-growing, annual weed that tolerates drought and frost. The tough seed gets spread widely via farm machinery. Established plants develop a strong taproot making herbicide control difficult.							
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Norflurazon (Zoliar) AgNova	12**		Registered for control of grass and broadleaf weeds including Caltrop in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Caltrop in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4
Chickweed (<i>Stellaria media</i>)							
Priority: Low							
Chickweed is ranked as a low priority. It is a low growing, winter annual weed that can continue growing all through summer. Targeting weed control prior to flowering is critical.							
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Registered in red beet for control of grass and broadleaf weeds, including Chickweed . Apply at sowing, or as soon as possible after planting, before crop emerges.	NR	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Chickweed . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Chickweed . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL (excl. QLD)	R4
Ethofumesate (Tramat)	15**	Beet Crops / Pre-Emergent	Registered in beet crops for control of grass and broadleaf weeds, including Chickweed . Apply before weeds or crop emerge, either pre- or post-sowing.	NR	A	ALL (excl. WA)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow 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)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Chickweed . Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4
Propachlor (Ramrod) Nufarm	15**	Beetroot / Pre-Emergent	Registered in beetroot for control of Potato Weed. Registered for control of grass and broadleaf weeds, including Chickweed in maize, sorghum, sweet corn, onions, broccoli, brussel sprouts, cabbages, cauliflower and Chinese cabbage.	NR	P-A	ALL	R4
Metamitron	5**		Metamitron is not registered in Australia. NZ registration for control of grass and broadleaf weeds, including Chickweed , in fodder beet, red beet (beetroot), sugar beet and mangolds.		P		R4
Norflurazon (Zoliar) AgNova	12**		Registered for control of grass and broadleaf weeds including Chickweed in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Chickweed in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4
Nutgrass (<i>Cyperus rotundus</i>)							
Priority: Low							
Nutgrass is ranked as a low priority. It prefers damp, water-logged soils and can survive for years underground during dry times. Herbicide options are limited and unreliable. Improve soil drainage if possible.							
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Cyhalofop-Butyl + Florpyrauxifen-Benzyl (Agixa Rinskor) Corteva	1*** + 4**		Registered for control of Nutgrass in rice.		P		R4
Halosulfuron-Methyl (Sempra)	2***		Registered for control of Nutgrass in turf and sugarcane.		P		R4
Norflurazon (Zoliar) AgNova	12**		Registered for control of Nutgrass in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
Potato Weed (<i>Galinsoga</i> spp.)							
Priority: Low							
Potato Weed is ranked as a low priority. It is an annual broadleaf weed that is spread via seed, producing several generations in one year that can remain dormant for some time. It forms a dense mat, outcompeting newly germinating crop seedlings. It can be controlled by herbicides but ongoing management is critical as seed can survive long periods underground.							
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Registered in red beet for control of grass and broadleaf weeds, including Potato Weed . Apply at sowing, or as soon as possible after planting, before crop emerges.	NR	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Potato Weed . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Potato Weed . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL (excl. QLD)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Potato Weed . Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4
Propachlor (Ramrod) Nufarm	15**	Beetroot / Pre-Emergent	Registered in beetroot for control of Potato Weed . Apply to the soil surface prior to weed or seedling crop emergence.	NR	A	ALL	R4
Clomazone	13**	Pre-Emergence Weed Control	Registered for control of various broadleaf weeds, including Potato Weed in cucumber, pumpkins, kabocha, squash, rockmelons, watermelon, zucchini, green beans, navy bean and poppies.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Potato Weed in Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4
Shepherd's Purse (<i>Capsella bursa-pastoris</i>)							
Priority: Low							
Shepherd's Purse is ranked as a low priority. It is an erect, annual broadleaf which is adapted to a wide range of environments. Herbicide options can be unreliable and timely application is critical to target young and actively growing weeds.							
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Registered in red beet for control of grass and broadleaf weeds, including Shepherd's Purse . Apply at sowing, or as soon as possible after planting, before crop emerges.	NR	A	ALL	R4
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Shepherd's Purse . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL	R4

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot / Pre-Emergent	Permitted in beetroot for control of grass and broadleaf weeds, including Shepherd's Purse . Apply at sowing, or as soon as possible after planting, before crop emerges. Maximum of 1 application per crop.	NR NG	A	ALL (excl. QLD)	R4
Ethofumesate (Tramat)	15**	Beet Crops / Pre-Emergent	Registered in beet crops for control of grass and broadleaf weeds, including Shepherd's Purse . Apply before weeds or crop emerge, either pre- or post-sowing.	NR	A	ALL (excl. WA)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Registered for control of grass and broadleaf weeds as a pre-crop spray or fallow spray.	NR	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Registered as a pre-plant knockdown application for control of grass and broadleaf weeds.	NR	A	ALL	R1
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Registered in beetroot for control of grass and broadleaf weeds, including Shepherd's Purse . Apply to small (2 leaf stage), actively growing weeds. Retreatment interval and maximum number of applications per crop not specified.	56	A	ALL	R4
Metamitron	5**		Metamitron is not registered in Australia. NZ registration for control of grass and broadleaf weeds, including Shepherd's Purse , in fodder beet, red beet (beetroot), sugar beet and mangolds.		P		R4
Norflurazon (Zoliar) AgNova	12**		Registered for control of grass and broadleaf weeds including Shepherd's Purse in asparagus, citrus, grapes, nuts, stone & pome fruits.		P		R4
Oxyfluorfen (Goal)	14**		Registered for control of grass and broadleaf weeds, including Shepherd's Purse in fallow, Brassica vegetables and fruit and nut trees. Compatible with glyphosate and diquat/paraquat.		P		R4
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		R4

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
MRL Databases (DAFF)	https://www.agriculture.gov.au/agriculture-land/farm-food-drought/food/nrs/databases
APVMA Permit search	https://productsearch.apvma.gov.au/permits
APVMA Product search	https://productsearch.apvma.gov.au/products
AUSVEG	https://ausveg.com.au
Cotton Pest Management Guide 2025-26	https://www.cottoninfo.com.au/publications/cotton-pest-management-guide
CropLife Australia (resistance management)	https://www.croplife.org.au/resources/programs/resistance-management/
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, nematocides, 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 beetroot
- Appendix 2. Products available for control of insects and mites in beetroot
- Appendix 3. Products available for weed control in beetroot
- Appendix 4. Current permits for use in beetroot
- Appendix 5. Beetroot Maximum Residue Limits (MRLs)
- Appendix 6. Beetroot Agrichemical Regulatory Risk Assessment

Appendix 1. Products available for disease control in beetroot

Active Ingredient (Trade Name)	Chemical group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
1,3-dichloropropene + Chloropicrin + (Telone C-35)	8B	Vegetables / Soil fumigant	Plant parasitic nematodes, symphylans, wireworms, soil borne diseases (including <i>Fusarium</i> , <i>Verticillium</i> wilts, <i>Rhizoctonia</i> , & <i>Pythium</i>) and suppression of weeds. <i>For use by professional and registered fumigators only.</i>	ALL	NR	R4
Boscalid (Filan) BASF	7	Root & Tuber Vegetables	Sclerotinia Rot (<i>Sclerotinia minor</i> , <i>S. sclerotiorum</i>)	ALL	7	R4
Chlorothalonil (Bravo) PER82895	M5	Beetroot	<i>Alternaria</i> spp. <i>Botrytis</i> spp. Cercospora Leaf Spot (<i>Cercospora beticola</i>) Phoma Leaf Spot (<i>Phoma betae</i>)	ALL (excl. VIC)	7 NG	R2
Copper as Cupric Hydroxide (Champ DP) Nufarm	M1	Root & Tuber Vegetables, including Beetroot	Downy Mildew (<i>Peronospora farinosa</i>) Rust (<i>Uromyces betae</i>) Leaf Spot (<i>Alternaria</i> , <i>Cercospora</i> , <i>Septoria</i>) Target Spot / Early Blight (<i>Alternaria solani</i>), Irish Blight / Late Blight (<i>Phytophthora infestans</i>)	ALL	1	R4
Copper as Tribasic Copper Sulphate, Copper Ammonium Complex, Copper Oxychloride, Cuprous Oxide	M1	Red Beet	Downy Mildew (<i>Peronospora farinosa</i>) Rust (<i>Uromyces betae</i>)	ALL	1	R4
Dazomet (Basamid)	8F	General soil fumigant	Pre-plant fumigant in seed beds for control of soil fungi including <i>Pythium</i> , <i>Phytophthora</i> , <i>Sclerotinia</i> , <i>Sclerotium</i> , <i>Rhizoctonia</i> , <i>Verticillium</i> , <i>Plasmodiophora</i> , <i>Armillaria</i> and <i>Fusarium</i> spp. Nematodes, plus insects, weeds & soil fungi	ALL	NR	R4

Active Ingredient (Trade Name)	Chemical group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Difenoconazole (Digger) Nufarm	3	Beetroot	Leaf Spot (<i>Alternaria</i> spp, <i>Cercospora</i> spp.)	ALL	4	R3
Dimethomorph + Ametoctradin (Zampro) AgNova	40+45	Beetroot	Downy Mildew (<i>Peronospora</i> spp.)	ALL	14	R4
Fludioxonil + Sedaxane (Vibrance Premium) Syngenta	12+7	Beetroot	Suppression of: Rhizoctonia (<i>Rhizoctonia solani</i>)	ALL	NR	R4
Iodine	-	Root Crops	Post-Harvest Sanitiser – Bacteria and Fungi	ALL	NR	R4
Iprodione (Rovral) PER81589	2	Beetroot	Alternaria Leaf Spot (<i>Alternaria</i> spp.) Sclerotinia Rot (<i>Sclerotinia</i> spp.) Grey Mould (<i>Botrytis</i> spp.)	ALL (excl. VIC)	14	R4
Mancozeb	M3	Beetroot	Cercospora Leaf Spot Downy Mildew	ALL	14	R2
Mancozeb + Dimethomorph (Acrobat) PER14958	M3 + 40	Beetroot	Downy Mildew (<i>Peronospora</i> spp., <i>Pseudoperonospora</i> spp., <i>Bremia lactucae</i>) Alternaria Leaf Spots (<i>Alternaria</i> spp.)	ALL (excl. VIC)	14 NG	R2
Mancozeb + Metalaxyl (Ridomil Gold MZ) Syngenta PER14045	M3 + 4	Beetroot	Downy Mildew Alternaria Leaf Spots	ALL (excl. VIC)	14	R2
Metalaxyl-M (Apron)	4	Beetroot / Seed Treatment	Damping Off	ALL	NR	R4
Metalaxyl-M + Azoxystrobin (Uniform) PER90595	4+11	Beetroot	Pythium (<i>Pythium aphanidermatum</i>) Rhizoctonia (<i>Rhizoctonia solani</i>)	ALL (excl. VIC)	NR	R4
Metham Sodium	-	Food Crops / Pre-Plant Fumigant	Fungal diseases including <i>Rhizoctonia</i> , <i>Pythium</i> , <i>Fusarium</i> , <i>Phytophthora</i> , <i>Verticillium</i> , <i>Sclerotinia</i> and Club Root of crucifers & Nematodes	ALL	NR	R4

Active Ingredient (Trade Name)	Chemical group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Penthiopyrad (Fontelis) Corteva	7	Root & Tuber Vegetables, including Beetroot	Early Blight (<i>Alternaria</i> spp.) Powdery Mildew (<i>Erysiphe</i> spp.)	ALL	7 NG	R4
Phosphorous Acid PER14184	33	Beetroot	Damping Off (<i>Pythium</i> spp., <i>Phytophthora</i> spp., <i>Rhizoctonia</i> spp., <i>Fusarium</i> spp.)	ALL (excl. VIC)	1	R4
Propiconazole (Tilt) PER14479	3	Beetroot	Leaf Spot (<i>Cercospora</i> spp.)	ALL (excl. VIC)	1 NG	R3
Pydiflumetofen + Difenoconazole (Miravis Duo) Syngenta	7+3	Root Vegetables, including Beetroot	Early Blight / Target Spot / Leaf Spot (<i>Alternaria</i> spp.) Powdery Mildew (<i>Erysiphe</i> spp., <i>Oidium</i> spp.) Cercospora Leaf Spot (<i>Cercospora</i> spp.)	ALL	7 NG	R3
<i>Streptomyces lydicus</i> WYEC108 (Actinovate) Novozymes Bioag	BM 02	Vegetables	As a seed treatment for <i>Fusarium</i> , <i>Rhizoctonia</i> & <i>Pythium</i> Management	ALL	NR	R4
Sulphur	M2	Vegetables	Powdery Mildew Rust	ALL	NR	R4
Tebuconazole	3	Beetroot	Sclerotinia Rot (<i>Sclerotinia</i> spp.)	ALL	35 NG	R4
Tolclofos-Methyl (Rizolex) Sumitomo	14	Beetroot	<i>Rhizoctonia solani</i> <i>Rhizoctonia</i> spp.	QLD & NSW	NR	R4
Trifloxystrobin (Flint) PER14891	11	Beetroot	Alternaria Leaf Spot (<i>Alternaria</i> spp.) Cercospora Leaf Spot (<i>Cercospora beticola</i>)	ALL (excl. VIC)	7 G:7	R4
Zineb	M3	Beets	Cercospora Leaf Spot	ALL	7	R2

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

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
1,3-dichloropropene + Chloropicrin + (Telone C-35)	8	Vegetables	Soil borne pests including Nematodes. <i>For use by professional and registered fumigators only.</i>	ALL	NR	R4
Abamectin PER96841	6	Root & Tuber Vegetables	Suppression of Leafminers (<i>Liriomyza</i> spp.), including Vegetable Leafminer (<i>Liriomyza sativae</i>) Serpentine Leafminer (<i>Liriomyza huidobrensis</i>)	ALL (excl. VIC)	14 NG	R3
<i>Bacillus thuringiensis subsp. kurstaki</i> (DiPel)	11A	Vegetables	Lepidoptera	ALL	NR	R4
Carbaryl	1A	Root Vegetables - Beetroot	Brown Vegetable Weevil Wingless Grasshopper Green Vegetable Bug Heliothis Leaf Eating Ladybird Cutworms European Earwig Potato Moth Rutherglen Bug Armyworm	ALL	3	R4
Cyromazine (Diptex 150WP) PER81867	17	Root & Tuber vegetables	Liriomyza Species including: Vegetable Leafminer (<i>Liriomyza sativae</i>) Serpentine Leafminer (<i>Liriomyza huidobrensis</i>)	ALL	7 NG	R4
Dazomet (Basamid)	8F	Soil fumigant	Soil fungi, Nematodes, soil insects and weeds.	ALL	NR	R4
Dimethoate	1B	Beetroot	Aphids, Jassids, Mites, Leafhoppers, Green Vegetable Bug, Thrips, Wingless Grasshopper	ALL	14	R3
			Leaf Mining Fly	NSW		
			Red Legged Earth Mite	All (excl. QLD)		

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Emamectin (Proclaim Opti) Syngenta	6	Root & Tuber Vegetables including Beetroot	Diamondback Moth / Cabbage Moth (<i>Plutella xylostella</i>) Cabbage White Butterfly (<i>Pieris rapae</i>) Heliothis (<i>Helicoverpa</i> spp.) Cluster Caterpillar (<i>Spodoptera litura</i>) Loopers (<i>Chrysodeixis</i> spp.) Cabbage Centre Grub (<i>Hellula hydralis</i>)	ALL	3 NG	R3
Emulsifiable Botanical Oil (Eco-Oil)	-	Vegetables	Greenhouse Whitefly	ALL	NR	R4
Fluazaindolizine (Salibro ReKlemel) Corteva	N-UN	Root & Tuber Vegetables including Beetroot	Root Knot Nematode (<i>Meloidogyne</i> spp.)	ALL	NR	R4
Flubendiamide (Belt) Bayer	28	Root & Tuber Vegetables including Beetroot	Diamondback Moth (<i>Plutella xylostella</i>) Cabbage White Butterfly (<i>Pieris rapae</i>) Cluster Caterpillar (<i>Spodoptera litura</i>) Potato Moth (<i>Phthorimaea operculella</i>) Heliothis (<i>Helicoverpa</i> spp.)	ALL	1	R4
Fluopyram (Velum Prime) Bayer	N-3	Root & Tuber Vegetables	Root Knot Nematode (<i>Meloidogyne</i> spp.) Root Lesion Nematode (<i>Pratylenchus</i> spp.)	ALL	NR	R4
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Vegetables	Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and Leafhoppers. Suitable for organic growers	ALL	1	R4
Imidacloprid PER81260	4A	Beetroot	Aphids (<i>Aphidae</i> spp.) Thrips (<i>Thysanoptera</i> spp.), excluding Western Flower Thrips	ALL (excl. VIC)	3	R2
Iron EDTA Complex	-	Vegetables	Slugs & Snails	ALL	NR	R4

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Lambda-Cyhalothrin (Karate Zeon) PER11949	3A	Beetroot	Onion Thrips (<i>Thrips tabaci</i>) Plague Thrips (<i>Thrips imaginis</i>) Rutherglen Bug (<i>Nysius</i> spp.) Vegetable Loopers (<i>Chrysodeixis</i> spp.) Vegetable Weevil (<i>Listroderes difficilis</i>)	ALL (excl. VIC)	2	R4
Metaldehyde	-	Vegetables	Slugs & Snails	ALL	7 NG	R4
Metham Sodium	-	Pre-Plant Soil Fumigant	Plant parasitic Nematodes, weed seeds, and various fungal diseases	ALL	NR	R4
Methomyl PER82428	1A	Beetroot	<i>Helicoverpa</i> spp. Cucumber Moth Cluster Caterpillar Loopers Webworm Rutherglen Bug Thrips, including Western Flower Thrips	ALL	7	R2
Petroleum Oil	-	Beet	Aphids, Mites, Thrips & Leafhopper	ALL	NR	R4
Pirimicarb (Aphidex)	1A	Beetroot	Green Peach Aphid	ALL	2	R4
Potassium Salts of Fatty Acids (Natrasoap)	-	Vegetables	Aphids, Thrips, Mealybug, Two Spotted Mites, Spider Mite and Whitefly	ALL	NR	R4
Propargite (Omite)	12C	Vegetables	Two-Spotted Mite Spider Mites (<i>Tetranychus</i> spp.)	ALL	7	R3
Pymetrozine (Chess) Syngenta	9B	Beetroot	Potato Aphid (<i>Macrosiphum euphorbiae</i>) Green Peach Aphid (<i>Myzus persicae</i>)	ALL	14	R3
Pyriproxyfen (Distance Ant Bait) Sumitomo	7C	Vegetables	Invasive & Nuisance Ants	ALL	NR	R4

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Spinetoram (Success Neo) Corteva	5	Root & Tuber Vegetables, including Beetroot	Light Brown Apple Moth Loopers <i>Helicoverpa</i> spp. Potato Moth Tomato Potato Psyllid (<i>Bactericera cockerelli</i>)	ALL	3	R4
Spinetoram (Success Neo) Corteva PER94451	5	Root & Tuber Vegetables, including Beetroot	Liriomyza Leafminers including: Vegetable Leafminer (<i>Liriomyza sativa</i>) Pea Leafminer / Serpentine Leafminer (<i>Liriomyza huidobrensis</i>) American Serpentine Leafminer (<i>Liriomyza trifolii</i>)	ALL (excl. VIC)	3	R4
Spinosad (Entrust Organic) Corteva	5	Root & Tuber Vegetables, including Beetroot	Lightbrown Apple Moth Loopers Heliothis Potato Moth	ALL	3 G:14	R4
Spinosad (Entrust Organic) Corteva PER94331	5	Root & Tuber Vegetables including Beetroot	Leaf Miners (<i>Liriomyza</i> spp.) including: Vegetable Leaf Miner (<i>Liriomyza sativae</i>) Pea Leaf Miner/Serpentine Leaf Miner (<i>Liriomyza huidobrensis</i>) American Serpentine Leaf Miner (<i>Liriomyza trifolii</i>)	ALL (excl. VIC)	3 G:14	R4
Spinosad (Entrust Organic) Corteva PER89870	5	Root & Tuber Vegetables	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (excl. VIC)	3 G:14	R4
<i>Spodoptera frugiperda</i> Multiple Nucleopolyhedrovirus (Fawligen) AgBiTech PER90820	31	Root & Tuber Vegetables	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL	NR	R4

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Sulfoxaflor (Transform) Corteva	4C	Root & Tuber Vegetables	Green Peach Aphid Suppression of: Tomato Potato Psyllid, Rutherglen Bug	ALL	7	R4
Sulphur	UN	Vegetables	Mites	ALL	NR	R4
Trichlorfon (Lepidex)	1B	Vegetables	Cabbage White Butterfly Cabbage Moth Rutherglen Bug Green Vegetable Bug	ALL	2	R2

Appendix 3. Products available for weed control in beetroot

Active Ingredient (Trade Name)	Chemical Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
1,3-dichloropropene + Chloropicrin + (Telone C-35)	8	Vegetables	Plant parasitic Nematodes, Symphylans, Wireworms, soil borne diseases and suppression of weeds. <i>For use by professional and registered fumigators only.</i>	NR	ALL	R4
Chloridazon (Pyramin) BASF	5**	Red Beet / Pre-Emergent	Grass and Broadleaf Weeds	NR	ALL	R4
Chloridazon (Chloronion SC) UPL PER92389	5**	Beetroot	Grass & Broadleaf Weeds	NR NG	ALL	R4
Chloridazon (Chloronion SC) UPL PER94967	5**	Beetroot	Grass & Broadleaf Weeds	NR NG	ALL (excl. QLD)	R4
Clethodim (Select)	1***	Beetroot / Post-Emergent	Grass Weeds	7	ALL	R4
Ethofumesate (Tramat)	15**	Beet Crops / Pre-and Post-Emergent	Grass and Broadleaf Weeds	NR	ALL (excl. WA)	R4
Glyphosate (Roundup)	9**	General Pre-Crop Spray	Grass and Broadleaf Weeds	NR	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	General Pre-Crop Spray	Grass and Broadleaf Weeds	7	ALL	R1
Phenmedipham (Betanal) Bayer	5**	Beetroot / Post-Emergent	Grass and Broadleaf Weeds	56	ALL	R4
Propachlor (Ramrod) Nufarm	15**	Beetroot / Pre-Emergent	Potato Weed / Yellow Weed	NR	ALL	R4

Active Ingredient (Trade Name)	Chemical Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Quizalofop-P-Ethyl	1***	Beetroot / Post Emergent	Grass Weeds	14	ALL	R4
Sethoxydim (Sertin)	1***	Red Beet / Post- Emergent	Grass Weeds	28	ALL	R4

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

Appendix 4. Current permits for use in beetroot

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER94331	Spinosad (Entrust Organic) / Various Vegetables & Herbs / Dipteran Leaf Miners	29-Apr-24	30-Apr-26	Hort Innovation
PER81589 Version 3	Iprodione / Beetroot, Beetroot Leaves / Sclerotinia Rot, Grey Mould, Alternaria Leaf Spot	21-Sep-16	31-Jun-26	Hort Innovation
PER92389 Version 3	Chloridazon (Chloronion SC Herbicide) / Beetroot / Broadleaf Weeds	27-May-22	30-Sep-26	E.E. MUIR & SONS
PER81867 Version 3	Cyromazine (Diptex 150 WP) / Root & Tuber Vegetables / Liriomyza Leafminers	02-Dec-19	30-Sep-26	Hort Innovation
PER14045 Version 4	Mancozeb + Metalaxyl (Ridomil Gold MZ) / Beetroot / Downy Mildew & Alternaria Leaf Spots	01-Apr-13	31-Mar-27	Hort Innovation
PER90820 Version 4	<i>Spodoptera frugiperda</i> Multiple Nucleopolyhedrovirus (Fawligen) / Root & Tuber Vegetables / Fall Armyworm	30-Mar-21	31-Mar-27	AgBiTech
PER81260 Version 4	Imidacloprid / Beetroot / Aphids & Thrips	01-Dec-15	31-Jul-27	Hort Innovation
PER94967 Version 2	Chloridazon (Chloronion SC Herbicide) / Beetroot / Broadleaf Weeds	31-Jul-24	31-Jul-27	YENDA PRODUCERS
PER94451	Spinetoram (Success Neo) / Various Vegetable & Herb Crops / Leaf Miners	05-Jul-24	31-Jul-27	Hort Innovation
PER14958 Version 3	Mancozeb and Dimethomorph (Acrobat) / Beetroot / Downy Mildew & Alternaria Leaf Spots	21-Dec-14	31-Oct-27	Hort Innovation
PER96841	Abamectin / Root & Tuber Vegetables / Liriomyza Leafminer	08-Aug-25	31-07-28	Hort Innovation
PER90595 Version 2	Metalaxyl-M + Azoxystrobin (Uniform) / Beetroot / Pythium & Rhizoctonia	30-Jun-21	31-Jan-29	Hort Innovation
PER82428 Version 5	Methomyl / Root & Tuber Vegetables / <i>Helicoverpa</i> spp., Cucumber Moth, Cluster Caterpillar, Looper, Webworm, Rutherglen Bug, Thrips including Western Flower Thrips	22-Apr-16	31-Jan-29	Hort Innovation
PER14891 Version 4	Trifloxystrobin (Flint) / Beetroot / Alternaria Leaf Spot and Cercospora Leaf Spot	01-Jan-15	30-Jun-29	Hort Innovation
PER14479 Version 6	Propiconazole (Tilt) / Beetroot / Cercospora Leaf Spot	12-May-14	31-Aug-29	Hort Innovation

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER11949 Version 5	Lambda-Cyhalothrin (Karate Zeon) / Beetroot / Onion Thrips, Plague Thrips, Rutherglen Bug, Vegetable Loopers, Vegetable Weevil	01-Apr-10	30-Nov-29	Hort Innovation
PER14184 Version 4	Phosphorous Acid / Beetroot / Damping Off	01-Jul-13	31-Mar-30	Hort Innovation
PER82895 Version 3	Chlorothalonil (Bravo) / Beetroot / Various Leaf Diseases	04-Aug-17	31-May-30	Hort Innovation
PER89870 Version 3	Spinosad (Entrust Organic) / Root & Tuber Vegetables / Fall Armyworm	21-Jul-20	31-Oct-30	Hort Innovation

Appendix 5. Beetroot Maximum Residue Limits (MRLs)

CODEX commodity groupings of root and tuber vegetables and subgroups:

VR 0075	Root and tuber vegetables
VR 2070	Root vegetables
VR 0574	Beetroot
VR 4564	Red Beet
	Vegetables

Note: Major export markets for Beetroot include Singapore, Japan, Malaysia, Thailand and Hong Kong. Available information indicates that in the absence specific limits in legislation the most countries defer to Codex, followed by EU MRL standards, or apply a 0.01ppm default value. Food exported to New Zealand from Australia may be legally sold if it complies with Australian requirements. MRLs and legislation are subject to change; the values presented should not be relied on.

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
2,2-DPA		Vegetables	*0.1	-
Abamectin	VR0075	Root and tuber vegetables	*0.01	-
Aldrin and Dieldrin	VR0075	Root and tuber vegetables	E0.1	E0.1
Ametoctradin	VR0574	Beetroot	0.3	-
Azoxystrobin	VR0075	Root and tuber vegetables {except potato; sugar beet}	-	1
	VR0574	Beetroot	T*0.005	-
Bifenthrin	VR0075	Root and tuber vegetables	-	0.05
Bixafen	VR0075	Root and tuber vegetables	-	0.06
Boscalid	VR0075	Root and tuber vegetables	1	2
Carbaryl	VR0574	Beetroot	0.5	0.1
Chlorantraniliprole	VR0075	Root and tuber vegetables {except potato}	T0.5	-
	VR0075	Root and tuber vegetables {except carrot; radish}	-	0.02
Chlordane		Vegetables {except fruiting vegetables, cucurbits, sugar beet}	E0.02	E*0.02
Chloridazon	VR0574	Beetroot	0.5	-
Chlorothalonil	VR0075	Root and tuber vegetables {except horseradish}	-	0.3
		Vegetables {except asparagus; brussels sprouts; carrot; celery; fennel, bulb; fruiting vegetables, cucurbits; galangal, greater; galangal, lesser; garlic; peas; leafy vegetables; leek; onion, bulb; potato; pulses; spring onion; tomato}	T7	-
Chlorpyrifos		Vegetables	T*0.01	-
Clothianidin	VR0075	Root and tuber vegetables	-	0.2
Cyantraniliprole	VR0075	Root and tuber vegetables {except potato}	-	0.05
Cycloxydim	VR0574	Beetroot	-	0.2
Cyhalothrin (includes lambda-cyhalothrin)	VR0075	Root and tuber vegetables	-	*0.01
	VR0574	Beetroot	*0.01	-

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Cypermethrins (including alpha- and zeta-cypermethrin)	VR0075	Root and tuber vegetables {except sugar beet}	-	*0.01
	VR0574	Beetroot	T0.1	-
Cyromazine	VR0075	Root and tuber vegetables	T1	-
DDT		Vegetables	E1	-
Diafenthiuron		Vegetables	0.7	
Diazinon		Vegetables	0.7	-
Dicofol		Vegetables {except cucumber; gherkin; tomato}	5	-
Difenoconazole	VR0574	Beetroot {except celeriac}	0.5	-
Dimethenamid-P	VR0574	Beetroot	-	0.01*
Dimethoate	VR0574	Beetroot	*0.1	-
Dimethomorph	VR0574	Beetroot	0.3	-
Diquat		Vegetables {except beans; broad bean; lupin (dry); onion, bulb; peas; potato; soya bean (dry); sugar beet}	*0.05	-
Dithiocarbamates	VR0574	Beetroot	1	-
EPTC		Vegetables	*0.04	-
Emamectin	VR0075	Root and tuber vegetables {except potato}	*0.01	-
Ethofumesate	VR0574	Beetroot	0.1	-
Fluazaindolizine	VR0075	Root and tuber vegetables	0.3	-
Fluazifop-p-butyl	VR0075	Root and tuber vegetables {except potato; sweet potato; taro; yam bean; yams}	1	-
Flubendiamide	VR0075	Root and tuber vegetables {except potato}	0.2	-
Fludioxonil	VR0574	Beetroot	*0.01	-
Fluensulfone	VR0075	Root and tuber vegetables	2	-
	VR0574	Beetroot	-	4
Fluopyram	VR0075	Root and tuber vegetables {except sweet potato}	0.2	-
Flupyradifurone	VR0075	Root and tuber vegetables {except potato}	-	0.7
Glyphosate	VR0075	Root and tuber vegetables	*0.1	-
Heptachlor		Vegetables {except carrot; soya bean (dry); tomato}	E0.05	-
Imidacloprid	VR0075	Root and tuber vegetables	-	0.5
	VR0574	Beetroot	T0.05	-
Indoxacarb	VR0574	Beetroot	-	0.5
Inorganic Bromide		Vegetables {except peppers, sweet [capsicum]}	20	
Iprodione	VR0574	Beetroot	T0.1	-
Kresoxim-Methyl		Beetroot	-	*0.05
Lindane		Vegetables	E2	-
Linuron		Vegetables {except carrot, celeriac; celery; leek; parsnip}	*0.05	-
Metalaxyl	VR0574	Beetroot	T*0.01	-
Metaldehyde		Vegetables	1	-
Methomyl	VR0075	Root and tuber vegetables	1	-
Methyl Bromide		Vegetables {except cucumber; peppers}	T*0.05	-
Myclobutanil	VR0075	Root and tuber vegetables	-	0.06

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Omethoate	VR0574	Beetroot	*0.05	-
Paraquat	VR0075	Root and tuber vegetables	-	0.05
		Vegetables {except potato; pulses}	*0.05	-
Pendimethalin	VR0075	Root and tuber vegetables {except carrot}	*0.05	-
Penthiopyrad	VR0075	Root and tuber vegetables {except potato}	2	-
Phenmedipham	VR0574	Beetroot	0.5	-
Phosphine	VR0075	Root and tuber vegetables	T*0.01	-
Phosphorous acid	VR0075	Root and tuber vegetables {except potato}	T100	-
Piperonyl Butoxide	VR0075	Root and tuber vegetables {except carrot}	-	0.5
		Vegetables	8	-
Pirimicarb	VR0075	Root and tuber vegetables	-	0.05
		Vegetables {except celeriac; celery; leafy vegetables; onion, welsh; pulses; shallot; spring onion; sweet corn (corn-on-the-cob)}	T*0.05	-
Prometryn		Vegetables	*0.1	-
Propachlor	VR0574	Beetroot	*0.05	-
Propargite		Vegetables	3	-
Propiconazole	VR0574	Beetroot	*0.02	-
Pydiflumetofen	VR0075	Root and tuber vegetables {except potato}	0.3	-
Pyrethrins	VR0075	Root and tuber vegetables	-	*0.05
		Vegetables	1	-
Pymetrozine	VR0574	Beetroot	*0.02	-
Quizalofop-ethyl	VR0574	Beetroot	0.02	-
Quizalofop-P-tefuryl	VR0574	Beetroot	0.02	-
Sedaxane	VR0574	Beetroot	*0.01	-
Sethoxydim	VR0075	Root and tuber vegetables	1	-
Spinetoram	VR0075	Root and tuber vegetables	0.02	-
Spinosad	VR0075	Root and tuber vegetables	0.02	-
Sulfoxaflor	VR0075	Root and tuber vegetables	0.05	-
	VR0075	Root and tuber vegetables {except carrot}	-	0.03
Tebuconazole	VR0574	Beetroot	T0.3	-
Thiamethoxam	VR0075	Root and tuber vegetables	T0.7	0.3
Tolclofos-methyl	VR0574	Beetroot	*0.01	-
Trichlorfon	VR0574	Beetroot	0.2	-
Trifloxystrobin	VR0574	Beetroot	T0.5	-
Trifluralin		Vegetables {except carrot; parsnip; fennel, bulb; galangal, greater}	0.05	-

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

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

T =Temporary MRL

E = The MRL is based on extraneous residues

Sources: APVMA MRLs: Agricultural and Veterinary Chemicals Code (MRL Standard) Instrument 2023. Compilation 12. Prepared 29 November 2025. CODEX MRLs: CODEX Alimentarius International Food Standards database (February 2026), <http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/>

Appendix 6: Beetroot Agrichemical Regulatory Risk Assessment

Beetroot Agrichemical Regulatory Risk Assessment

November 2025

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 require 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 to ensure compliance, as 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. Consequently, 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 Beetroot in Australia, as well as assisting with any current initiatives aimed at identifying and addressing pest management deficiencies.

R0	Use no longer approved
R1	Short-term: Critical concern over retaining access < 1 year
R2	Medium-term: Maintaining access of significant concern <2-5 years
R3	Long-term: Potential issues associated with use – Monitoring required < 5 years
R4	No current risk/concerns

INSECTICIDES/MITICIDES/NEMATOCIDES - Insect and other pests

Active Constituent	MoA Group	Pest	Risks and Comments
ABAMECTIN	6	Vegetable leafminer	Australia: APVMA nominated for reconsideration and spray drift assessment. Canada: Re-evaluation finalised. Label amendments to mitigate risks to human health and environment (July, 2025)
CARBARYL	1A	Armyworm; Budworm/Helicoverpa; Cabbage white butterfly; Cutworms; Diamondback moth; Earwigs; Green vegetable bug; Leaf eating Ladybirds; Potato moth; Pumpkin beetle; Rutherglen bugs; Vegetable weevil; Wingless grasshopper	Australia: No current concerns. Codex MRL: 0.1 mg/Kg EU: Not approved Canada: In re-evaluation USA: Under Registration Review (scheduled)
CHLORPYRIFOS	1B	--	Australia: The chemical review was completed in September 2024. Most uses in horticultural crops were removed. After 30 September 2025, products with previously approved labels must not be supplied. The only remaining approved use is in Brassica crops as specified on current labels. EU: Not approved Canada: Cancelled USA: Agricultural uses cancelled. Very few registrations as Restricted Use Pesticide.
CYROMAZINE	17	Leaf Miner	Australia: No current concerns. Permit PER81867 Expiry date: 30/09/2026 EU: Not approved

Active Constituent	MoA Group	Pest	Risks and Comments
DIAZINON	1B		Australia: Australia: APVMA made a Final Decision on 2024 . After 10 September 2025, crop uses are no longer approved. Codex: All MRLs deleted EU: Not approved Canada: Cancelled USA: Under Registration Review (scheduled)
DIMETHOATE	1B	Leafminer flies; Aphids; Green vegetable bug; Jassids/Leafhoppers; Mites; Red-legged earth mite; Thrips; Wingless grasshopper	Australia: APVMA reconsideration. Prioritised to be commenced by 2029 . EU: Not approved Canada: In re-evaluation USA: Under Registration Review (scheduled)
EMAMECTIN	6	Diamondback Moth (Cabbage Moth) (<i>Plutella xylostella</i>), Cabbage White Butterfly (<i>Pieris rapae</i>) Heliothis (<i>Helicoverpa</i> spp.) Cluster caterpillar (<i>Spodoptera litura</i>) Loopers (<i>Chrysodeixis</i> spp.) Cabbage Centre Grub (<i>Hellula Hydralis</i>)	Australia: APVMA Nominated for targeted spray drift reconsideration EU: Approved, candidate for substitution. UK: Withdrawn (2024).
FLUAZAIINDOLIZINE	N-UN	Root Knot Nematode	Australia: No current concerns. EU: Pending
FLUBENDIAMIDE	28	Budworm/Helicoverpa; Cabbage white butterfly; Cluster caterpillar; Diamondback moth; Potato moth	Australia: No current concerns. EU: Not approved UK: Withdrawn (2024).
IMIDACLOPRID	4A	Aphids & Thrips	Australia: APVMA: Currently under review . Proposed regulatory decisions expected between December 2025 to October 2026. Permit PER81260 Expiry date: 30/06/2027 EU: Not approved Canada: Very few uses allowed in greenhouses and seed treatment. USA: Under Registration Review (scheduled)

Active Constituent	MoA Group	Pest	Risks and Comments
LAMBDA-CYHALOTHRIN	3A	Onion thrips; Plague thrips; Rutherglen bug; Vegetable Loopers; Vegetable weevil.	Australia: No current concerns. Permit PER11949 Expiry date: 30/11/2029 EU: Approved, candidate for substitution.
PIRIMICARB	1A	Green peach aphid	Australia: No current concerns. EU: Approved, candidate for substitution. Canada: Cancelled
PROPARGITE	12C	Spotted Mite, Two Spotted Mite	Australia: APVMA reconsideration. Prioritised to be commenced by 2029. EU: Not approved Canada: Cancelled USA: Under Registration Review (scheduled)
PYMETROZINE	9B	Green peach aphid; Potato aphid	Australia: APVMA nominated for reconsideration and spray drift assessment. EU: Not approved Canada: Cancelled
PYRETHRINS	3A	Ant, Aphid, Budworms, Caterpillar, Leafhopper, Thrip,	Australia: No current concerns.
SPINETORAM	5	Budworm/Helicoverpa; Lightbrown apple moth; Loopers; Potato moth. Leaf miners (Liriomyza spp.) PER94451-Expiry 31/07/2027 for Vegetable leaf miner; Pea leaf miner/Serpentine leaf miner; American serpentine leaf miner.	Australia: No current concerns. Permit PER94451 Expiry date: 31/07/2027 EU: Not approved UK: Withdrawn (2024). Canada: In re-evaluation

Active Constituent	MoA Group	Pest	Risks and Comments
SPINOSAD	5	Budworm/Helicoverpa; Cabbage centre grub; Cabbage white butterfly; Cluster caterpillar; Cucumber moth; Lightbrown apple moth; Loopers; Potato moth; Western flower thrips. PER94331- Expiry date 30/04/2026 for Leaf miners (Liriomyza spp.)	Australia: No current concerns. Permit PER94331 Expiry date: 30/04/2026 Canada: In re-evaluation
SPODOPTERA FRUGIPERDA NPV	--	PER90820 for the control of Fall Armyworm	Australia: No Current Concerns. Permit PER90820 Expiry date: 31/03/2027
SULFOXAFLOX	4C	Green peach aphid; Tomato/potato psyllid	Australia: No current concerns.

FUNGICIDES – Disease Control

Active Constituent	MoA Group	Pest	Risks and Comments
AMETOCTRADIN	45	Downy mildew	Australia: No current concerns.
AZOXYSTROBIN	11	Permit PER90595 for control of Damping off / Pythium; Rhizoctonia.	Australia: No current concerns. Permit PER90595 Expiry date: 31/01/2029 Canada: In re-evaluation
BOSCALID	7	Sclerotinia rot	Australia: No current concerns. Canada: In re-evaluation
CHLOROTHALONIL	M5	Alternaria spp. Botrytis spp. Cercospora Leaf Spot (Cercospora beticola) Phoma Leaf Spot (Phoma betae)	Australia: APVMA reconsideration. Prioritised to be commenced by 2028. EU: Not approved Canada: In re-evaluation USA: Under Registration Review (scheduled)
COPPER	M1	Downy mildew; Rust	Australia: No current concerns.

Active Constituent	MoA Group	Pest	Risks and Comments
DIFENOCONAZOLE	3	Alternaria leaf spot; Leaf spot	Australia: APVMA nominated for reconsideration after 2029. EU: Approved, candidate for substitution. Canada: In re-evaluation
DIMETHOMORPH	40	Downy mildew.	Australia: No current concerns. EU: Not approved Canada: In re-evaluation
FLUDIOXONIL	12	Rhizoctonia.	Australia: No current concerns. EU: Approved, candidate for substitution.
IPRODIONE	2	Alternaria leaf spot; Sclerotinia Rot; Grey mould	Australia: No current concerns. Permit PER81589 Expiry date: 30/06/2026 EU: Not approved USA: Under Registration Review (scheduled)
MANCOZEB	M3	Alternaria leaf spot; Cercospora leaf spot; Downy mildew; Leaf spot; Powdery mildew; Rust. Permit for a product that contains Mancozeb + Metalaxyl to control Downy mildew Alternaria leaf spots.	Australia: APVMA reconsideration. Prioritised to be commenced by 2027. EU: Not approved UK: Withdrawn (2024). USA: Under Registration Review (scheduled)
METALAXYL	4	Damping off / Pythium; Downy mildew	Australia: No current concerns. Permit PER90595 Expiry date: 31/01/2029 EU: Approved, candidate for substitution. Canada: In re-evaluation
PENTHIOPYRAD	7	Alternaria leaf spot; Powdery mildew	Australia: No current concerns.
PHOSPHOROUS ACID AND SALTS	P07 (33)	Damping off and downy mildew	Australia: No current concerns. Permit PER14184 Expiry date: 31/03/2030

Active Constituent	MoA Group	Pest	Risks and Comments
PROPICONAZOLE	3	Leaf Spot (Cercospora spp.)	Australia: APVMA nominated for reconsideration and spray drift assessment. Permit PER14479 Expiry date: 31/08/2029 EU: Not approved Canada: In re-evaluation USA: Under Registration Review (scheduled)
PYDIFLUMETOFEN	7	Early blight (target spot, leaf spot) (Alternaria spp.) Powdery mildew (Erysiphe spp., Oidium spp.) Cercospora leaf spot (Cercospora spp.)	Australia: No current concerns. EU: Pending Canada: In re-evaluation
TEBUCONAZOLE	3	Sclerotinia Rot (Sclerotinia species); PER14479-Expiry date 31/08/2029 for Leaf Spot (Cercospora spp.)	Australia: APVMA: Removed from nomination list - maintain watching brief EU: Approved, candidate for substitution. Canada: In re-evaluation USA: Under Registration Review (scheduled)
TOLCLOFOS-METHYL	14	Rhizoctonia	Australia: No current concerns.
TRIFLOXYSTROBIN	11	Alternaria leaf spot	Australia: No current concerns. Permit PER14891 Expiry date: 30/06/2029 Canada: In re-evaluation

HERBICIDES – Weed Control

Active Constituent	MoA Group	Risks and Comments
CHLORIDAZON	5	Australia: No current concerns.
CLETHODIM	1	Australia: No current concerns.
DIQUAT	22	Australia: APAPVMA: Currently under review . Publication of the final regulatory decision is now expected in Mid 2026. EU: Not approved USA: No agricultural uses allowed. Aquatic herbicide.
ETHOFUMESATE	15	Australia: No current concerns. Canada: In re-evaluation
GLYPHOSATE	9	Australia: Nominated for targeted spray drift reconsideration USA: Under Registration Review (scheduled)
PARAQUAT	22	Australia: APVMA: Currently under review . Publication of the final regulatory decision is now expected in Mid 2026. Candidate chemical recommended to be listed to Rotterdam Convention. EU: Not approved Canada: Cancelled USA: Restricted use
PHENMEDIPHAM	5	Australia: No current concerns.
PROPACHLOR	15	Australia: No current concerns. EU: Not approved
QUIZALOFOP-P-ETHYL	1	Australia: No current concerns.
SETHOXYDIM	1	Australia: No current concerns. EU: Not approved Canada: Phase-Out

FUMIGANTS – Mixed Function

Active Constituent	Use	Risks and Comments
CHLOROPICRIN + 1,3-DICHLOROPROPENE	Control of soil borne diseases, plant parasitic Nematodes, Symphylans and Wireworms	CHLOROPICRIN Australia: No current concerns. EU: Not approved USA: Restricted use 1,3-DICHLOROPROPENE Australia: No current concerns. EU: Pending Canada: Cancelled
DAZOMET	Control of bacterial spot (<i>Xanthomonas</i> spp.) (suppression only). Soil insects and nematodes	Australia: No current concerns. USA: Under Registration Review (scheduled)
ETHANEDINITRILE	Soil borne pathogens, nematodes and weeds	Australia: No current concerns.
METHAM PRESENT AS SODIUM SALT	Germinating weeds and soil-borne fungus diseases	Australia: No current concerns.

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