The Spruce / K. Dave

Cherries

Strategic Agrichemical Review Process (SARP)

August 2022

Hort Innovation
Project – MT21005

Hort Innovation Project Number:
MT21005 –Strategic Agrichemical Review Process (SARP) Updates

SARP Service Provider:
AGK Services

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

Date of report:
August 2022

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1. Summary

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 cherry industry with sound pesticide usage for the future that the industry can pursue for registration with the manufacturer, or minor-use permits with the Australian Pesticide and Veterinary Medicines Authority (APVMA).

1.1 Diseases

The high priority diseases are:

Common Name	Scientific Name
Bacterial Canker / Gummosis	*Pseudomonas syringae pv. syringae*
Brown Rot / Blossom Blight	*Monilinia fructicola*, *M. laxa*

1.2 Insects and mites

The high priority insect and mite pests are:

Common Name	Scientific Name
Black Cherry Aphid	*Myzus cerasi*
European Earwig	*Forficula auricularia*
Queensland Fruit Fly	*Bactrocera tryoni*
Two Spotted Mite	*Tetranychus urticae*
Rust Mites	Eriophyidae
Western Flower Thrips	*Frankliniella occidentalis*
Plague Thrips	*Thrips imaginis*
Pear & Cherry Slug	*Caliroa cerasi*

1.3 Weeds

The high priority weeds are:

Common name	Scientific name
Marshmallow	*Malva parviflora*
Wireweed	*Polygonum* spp.

1.4 Plant Growth Regulators

The high priority Plant Growth Regulator issues are:

Issue
Control of Vegetative Growth
Advancement of Maturity
Increase Fruit Size

2. The Australian Cherry Industry

Cherries are a type of stone fruit with harvest occurring in the summer months and most of the production in southern states.

Total production for the year ending June 2021 was 20,074 tonnes[1]. Wholesale value of fresh supply was $206 m, with $169 m distributed into retail and $37.2 m into food service.

The major cherry growing states are Victoria, NSW and Tasmania. The production window is relatively narrow and domestic consumption follows this seasonal pattern. Cherry import volumes are relatively small.

Cherry Seasonality by State

State	20/21 t	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Victoria	5,661												
New South Wales	5,550												
Tasmania	5,038												
South Australia	3,152												
Western Australia	622												
Queensland	50												
Imports	1,345												
Availability legend			High			Medium			Low			None	

Australia exported 23% of total production in 2020/21. The main destinations for these cherries were Hong Kong, China, Vietnam, Singapore and Taiwan. Australia's exports have been growing in recent years and overseas markets are a key part of the industry's growth strategy.

[1] Hort Innovation (2021). Australian Horticulture Statistics Handbook 2020/21. [online] Available at: https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/grower-resources/ha18002-assets/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 cherry 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 cherry industry regarding pesticide access, Hort Innovation undertook a review of the pesticide requirements via a Strategic Agrichemical Review Process (SARP) in 2013. 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 cherry 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 cherry 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 cherries but attempts to prioritise the major problems.

Exotic plant pests, not present in Australia, are not addressed in this document.

3.2 Minor use permits and registration

From a pesticide access perspective, the APVMA classifies cherries as a major crop. Cherries fit within the APVMA crop group 003: Stone Fruits, Subgroup 003A: Cherries. Therefore, access to minor use permits can be relatively difficult unless a reasonable justification is provided in accordance with the APVMA's minor use guidance[2].

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 Cherry industry is for manufacturers to register new pesticides uses in the crop.

[2] https://apvma.gov.au/node/10931

3.3 Methods

The current update of the Cherry Strategic Agrichemical Review Process (SARP), which was last updated in 2013, was conducted by desktop audit using industry information gathered during 2021-2022. The process included gathering, collating and confirming information:

Process of Review	Activity
Industry survey	Preparation and circulation of online industry survey to update priority pests and identify priority control gaps. Survey released: 17 November 2021 Survey closed: 28 February 2022
SARP data updated via a desktop audit	Updated registrations and permits Updated MRL tables Updated available and potential pesticides against low, moderate and high priority pests, including an assessment of their suitability Included information on regulatory risks from MT20007
Captured industry input	Collated and analysed survey results Consolidated and incorporated industry needs and insights

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 cherries
Appendix 2. Products available for control of insects and mites in cherries
Appendix 3. Products available for weed control in cherries
Appendix 4. Plant growth regulators available in cherries
Appendix 5. Current permits for use in cherries
Appendix 6. Cherry Maximum Residue Limits (MRLs)
Appendix 7. Cherry Agrichemical Regulatory Risk Assessment

4. Diseases, Pests and Weeds of Cherries

Resistance management: To manage the risk of resistance development, integrated disease/pest/weed management (IDM/IPM/IWM) strategies should be adopted. The general principle is to integrate diverse chemical and non-chemical strategies; maximise efficacy; not rely on singular tools and rotate between different modes of action. It is always essential to follow all the label instructions. Specific resistance management strategies may apply. These can be found, along with other useful information, on the CropLife Australia website[3].

In Chapter 4 information on regulatory risk derived from project MT20007 (Regulatory support and coordination) has been incorporated.

Some of the suggested options have no overseas MRLs (see Appendix 6).

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.

[3] https://www.croplife.org.au/resources/programs/resistance-management/

4.1 Diseases of cherries

4.1.1 Disease priorities

Common name	Scientific name
High	
Bacterial Canker / Gummosis	*Pseudomonas syringae pv. syringae*
Brown Rot / Blossom Blight	*Monilinia fructicola*, *M. laxa*
Moderate	
Botrytis / Grey Mould	*Botrytis* spp.
Brown Spot	*Alternaria alternata*
Shot Hole	*Stigmina carpophila*
Crown Gall	*Agrobacterium tumefaciens*
Phytophthora Trunk & Stem Canker	*Phytophthora cinnamomi*
Little Cherry Virus	Closteroviridae
Prunus Necrotic Ringspot Virus	Bromoviridae
Transit Rot - Post Harvest	*Rhizopus stolonifer*
Low	
Leaf Curl	*Taphrina cerasi*
Rust	*Tranzschelia discolor*
Bacterial Spot	*Xanthomonas arboricola pv pruni*
Freckle & Scab	*Cladosporium carpophilum*
Fungal Gummosis	*Botryosphaeria dothidea*
Silver Leaf	*Chondrostereum purpureum*

The high priority diseases identified based on the feedback received were Bacterial Canker / Gummosis and Brown Rot / Blossom Blight. A planned disease management strategy is critical to ensure control of these diseases across the whole production cycle. Brown Rot is the most significant post-harvest disease of cherries, but it needs to be managed in-crop when the initial infection occurs, as well as requiring post-harvest treatments to preserve fruit quality during transportation and storage. Available and potential products for control of diseases are listed in Section 4.1.2.

Fungicides should be supplemented by cultural practices to increase airflow and minimise moisture in the plant canopy. This can include planting configuration and irrigation management. Other cultural controls include the use of disease-free seed and/or transplants, resistant varieties, and general farm hygiene including removal of crop residues and controlling weeds in and around crops.

Resistance Management

Resistance by fungal pathogens to fungicides usually evolves following the intensive use of fungicides for disease control. In any fungal population there are likely to be individuals that have some degree of natural resistance, and which are less susceptible to fungicides, even before the chemicals are used. Resistance arises mainly through the incorrect use of fungicides, which selects for the resistant individuals. Continued use of a fungicide or fungicide chemical group can result in a significant build-up of resistant individuals in the fungal population – to the point where that product, or other products from the same chemical group, is no longer effective. In some cases, removal of the selection pressure can result in the fungal population regaining its sensitivity to the fungicide group, but this is not always the case. The risk of fungicide resistance developing varies between different chemical groups and different fungal pathogens, such that specific strategies are recommended for those situations considered to carry the highest risk[4].

[4] 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 7)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required

Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Bacterial Canker / Gummosis (*Pseudomonas syringae pv. syringae*) **Priority: High**							
Rated as a high priority in SA and VIC, and as a moderate priority in TAS and NSW. Bacterial Canker can affect all parts of the tree. Economic losses result from a reduction in fruit yield, and branches or whole trees dying. Avoid damage to trees during the highly susceptible winter period. Ensure good soil drainage. Use clean grating wood and canker resistant or tolerant varieties. Careful monitoring and removal of diseased tissues are recommended.							
Bacillus amyloquefaciens strain QST 713 (Serenade Opti) Bayer PER88559	BM 01	Biological	NR	A	ALL (excl. VIC)	Permitted in cherries (field) for the suppression of Blossom Blight/Brown Rot (*Monilinia fructicola, M.laxa*), **Bacterial Canker** (*Pseudomonas* spp.), Brown Spot (*Alternaria alternata*), Bacterial Spot (*Xanthomonas* spp.) and Botrytis Grey Mould (*Botrytis cinerea*). Apply as a preventative treatment prior to disease development. Re-treat at 3-7 day intervals. Number of applications not specified.	-
Copper (Cu) present as Copper Ammonium Acetate Copper Hydroxide Cuprous Oxide	M1	Protectant	1	A	NSW, VIC, TAS, SA & WA	Registered in cherries for control of **Bacterial Gummosis**. Apply one week after petal fall. Repeat application 7-10 days later. Number of applications not specified.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Copper (Cu) present as Copper Oxychloride	M1	Protectant	1	A	QLD	Registered in cherries for control of Bacterial Spot, **Bacterial Canker**, Leaf Curl and Shot Hole. Apply one week after petal fall. Repeat application 7-10 days later. Number of applications not specified.	-
Copper (Cu) present as Tribasic Copper Sulfate	M1	Protectant	1	A	ALL	Registered in cherries for control of Shot Hole and **Bacterial Gummosis**. Apply one week after petal fall. Repeat application 7-10 days later. Number of applications not specified.	-
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered for the suppression of Bacterial Speck, Bacterial Spot, **Bacterial Canker** and Powdery Mildew in tomatoes.	-
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological	NR	P		Registered for control of Botrytis and suppression of Anthracnose, Phomopsis and Rhizopus in berries, control of Botrytis and suppression of Sclerotinia in fruiting vegetables and cucurbits, and control of Botrytis in grapes.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of *Botrytis* in grapes and strawberries. US registration for control of ***Pseudomonas* spp.** in berries, fruiting vegetables, leafy vegetables, stone fruit, tobacco and tree nuts.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Brown Rot / Blossom Blight (*Monilinia fructicola*, *M. laxa*) **Priority: High**							
Rated as a high priority in VIC, NSW and SA, and as a moderate priority in TAS. Brown Rot / Blossom Blight infects cherries during flowering or fruit set, but these infections are usually not obvious until after harvest. They have serious impacts on fruit quality and marketability. Management controls include the removal of rotten/mummified fruit and cankered and dead twigs to reduce over-wintering of inoculum, monitoring orchards during critical infection periods, and the use of a strategic fungicide program. There are a number of post-harvest strategies available to maintain fruit quality during storage and distribution to market. A pre-harvest rot incubation can be used on farm to determine the need for post-harvest treatments.							
Bacillus amyloquefaciens strain QST 713 (Serenade Opti) Bayer PER88559	BM 01	Biological	NR	A	ALL (excl. VIC)	Permitted in cherries (field) for the suppression of **Blossom Blight/Brown Rot** (*Monilinia fructicola, M.laxa*), Bacterial Canker (*Pseudomonas* spp.), Brown Spot (*Alternaria alternata*), Bacterial Spot (*Xanthomonas* spp.) and Botrytis Grey Mould (*Botrytis cinerea*). Apply as a preventative treatment prior to disease development. Re-treat at 3-7 day intervals. Number of applications not specified.	-
Bromo Chloro Dimethyl Hydantoin (BCDMH)	-	Sanitiser / Post-Harvest	NR	A	ALL	Registered in fruit as a sanitiser / post-harvest treatment for control of external rot causing organisms. Post-harvest spray or dip. Minimum contact time 60 seconds. Can also be used as a general disinfectant for equipment.	-
BLAD (Problad Plus)	BM 01	Biological	NR	A	ALL	Registered in cherries for suppression of **Brown Rot / Blossom Blight**. Begin application at white bud, make a second application at full bloom and if conditions remain favourable for disease, make another application at petal fall. For Brown Rot on fruit a second set of treatments should be applied at least a month before harvest. Re-treatment interval 7-14 days.	-
Captan	M4	Protectant	NR	A	ALL	Registered in stone fruit (except cherries) for control of **Blossom Blight / Brown Rot**. Apply at any of the following times as part of a spray program: white bud, 10% blossom, full bloom, petal fall and shuck fall and pre-harvest sprays at 6, 3 and 1 week prior to harvest. Apply no more than 5 applications per season.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Chlorine	-	Sanitiser / Post-Harvest	NR	A	ALL	Registered in fruit as a sanitiser / post-harvest treatment for control of bacteria and fungi. Post-harvest spray. Must make contact with the fruit for at least 30 seconds. Can also be used as a general disinfectant for equipment.	-
Chlorothalonil (Bravo)	M5	Protectant	7	A	ALL	Registered in cherries for control of **Brown Rot / Blossom Blight**, Shot-Hole, Stone Fruit Rust and Transit Rot. Apply at bud-swell, bud-burst, shuck fall and cap fall. Apply every 10-14 days. Number of applications not specified.	R3
Copper (Cu) present as Copper Oxychloride	M1	Protectant	1	A	NSW, VIC, TAS, SA & WA	Registered in stone fruit for control of **Blossom Blight**, Freckle, Rust, Leaf Curl and Shot Hole. Apply from late bud swell to early blossom. Number of applications not specified.	-
Fludioxonil (Scholar) Syngenta	12	Protectant / Post-Harvest	NR	A	ALL	Registered in stone fruit as a post-harvest treatment for control of **Brown Rot** (*Monilinia* spp.), Grey Mould (*Botrytis cinerea*) and Rhizopus Rot (*Rhizopus* spp.) Apply as a post-harvest dip for 30-60 seconds or as a drench for a minimum of 30 seconds.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	1	A	ALL	Registered in stone fruit for control of **Blossom Blight**, Shot Hole and **Brown Rot**. For Blossom Blight, the critical application timings are early blossom, full bloom and petal fall/shuck fall. For Brown Rot, critical period begins at fruit ripening and extends through to harvest. Use a re-treatment interval of 7-10 days. Apply a maximum of 2 applications per season.	-
Iodine	M	Protectant / Post-Harvest	NR	A	ALL	Registered in stone fruit as a post-harvest dip for control of bacteria and fungi. Dip the fruit for a minimum of 1 minute.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in stone fruit (except Wilson Plums) for control of **Brown Rot**, Freckle, Rust and Shot Hole. Apply at early bloom, then repeat at mid to full bloom, at petal fall, and at shuck fall. Continue with a protective spray program at 2 week intervals. Number of applications not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Mandestrobin (Intuity) Sumitomo	11	Protectant & Curative	7 G:7	A	ALL	Registered in stone fruit for control of **Blossom Blight** and **Brown Rot**. For Blossom Blight control, spray at 20% and again at 90% flowering. For Brown Rot control. Spray at 3 weeks and then 1 week pre-harvest. Do not use more than 2 applications per season.	-
Penthiopyrad (Fontelis) Corteva	7	Protectant	NR	A	ALL	Registered in stone fruit for control of **Brown Rot / Blossom Blight** (*Monilinia* spp.) and Scab / Freckle (*Cladosporium carpophilum*, *Venturia carpophila*). Use a re-treatment interval of 7-14 days. Do not use more than 3 applications per season, with no more than 2 consecutive applications.	-
Procymidone (Sumisclex)	2	Protectant & Curative	9	A	VIC, NSW, SA, TAS & QLD	Registered in stone fruit for control of **Blossom Blight**. Apply at 10% blossom, full bloom, late petal and shuck fall. Do not apply after shuck fall. Number of applications not specified.	R2
Propiconazole (Tilt)	3	Protectant & Curative	1	A	ALL	Registered in stone fruit for control of **Brown Rot / Blossom Blight**. For Blossom Blight control, apply at early blossom and again at full bloom. A further application is made at shuck fall. For Brown Rot control, apply at 3 weeks and then 1 week pre-harvest. Only 2 consecutive applications can be made during this period.	R3
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	2	A	ALL	Registered in cherries for control of **Blossom Blight / Brown Rot**. Use in a preventative spray program at 7-14 day intervals. Apply a maximum of 3 applications per year, with no more than 2 consecutive applications.	-
Sulphur	M2	Protectant	NR	A	ALL (excl. QLD)	Registered in stone fruit (except apricots) for control of **Brown Rot**. Apply 4 weeks after petal fall then as cover sprays. Number of treatments not specified.	-
					QLD	Registered in stone fruit (except apricots) for control of **Brown Rot**. Apply at petal fall only. Number of treatments not specified.	
Thiram	M3	Protectant	7	A	ALL	Registered in stone fruit for control of **Brown Rot** (Fruit) (*Monilinia fructicola*), Freckle (Apricot) (*Venturia carpophila*) and Shot-Hole (*Stigmina carpophila*). Apply early full bloom, after bud swell copper sprays and again 4 and 8 weeks later. (Apply 2 weeks after shuck fall for susceptible varieties). Number of applications not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Triforine	3	Protectant / Post-Harvest	NR	A	SA & WA	Registered in cherries as a post-harvest dip for control of **Brown Rot**. Dip for 30 seconds to ensure thorough wetting as soon as practical after harvest.	R3
Ziram	M3	Protectant & Curative	7	A	ALL	Registered in stone fruit (except apricots) for control of **Blossom Blight**, **Brown Rot**, Shot Hole, Freckle and Leaf Curl. Apply at mid full bloom, early petal fall and at shuck fall. Apply cover sprays at 14 day intervals after fruit commences to ripen. Also apply at 21 and 7 days before harvest. Number of applications not specified.	R2
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of *Botrytis* in grapes and strawberries. US registration for control of **Blossom Blight** / **Brown Rot** in stone fruit and tree nuts.	-
Cyprodinil (Chorus) Syngenta	9	Protectant & Curative		P		Registered for control of **Blossom Blight** / **Brown Rot** in apricot, nectarine, peach and plum.	-
Dodine (Syllit) Campbell	U12	Protectant & Curative		P		Registered for control of **Blossom Blight** in nectarine and peach.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New active in development from Corteva with activity on Septoria, Powdery Mildew, Botrytis, Anthracnose, Alternaria, Scab, **Monilinia**, Rust and Mycosphaerella spp. Scheduled for JMPR evaluation in 2023.	-
Fludioxonil + Azoxystrobin (Graduate A+) Syngenta	12+11	Protectant / Post-Harvest		P		Registered as a post-harvest treatment for control of Side Rot and Stem End Rot in avocado.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas and Grey Mould and Powdery Mildew in grapes. US registration for control of **Blossom Blight** / **Brown Rot** in stone fruit and almonds.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
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 *Alternaria*, ***Monilinia***, *Tranzschelia* and *Wilsonomyces* in stone fruit.	-
Potassium Silicate + Potassium Bicarbonate (EcoCarb Plus) OCP	M2	Protectant		P		Registered for control of **Brown Rot** in nectarines.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of various diseases in grapes, berries, leafy vegetables, lettuce and potato. Hort Innovation project ST20005 is generating data to support a label registration for control of Botrytis in stone fruit.	R3
Botrytis / Grey Mould (*Botrytis* spp.) **Priority: Moderate**							
Rated as a high priority in TAS, a moderate priority in SA and NSW, and as a low priority in VIC. Botrytis is a problem disease in wetter growing areas. Outbreaks are favoured by warm, humid conditions and affected fruit are unmarketable. Orchard hygiene and management of canopy structure are important to reduce infection, as well as the use of protectant fungicides when conditions are favourable for disease outbreaks.							
Bacillus amyloquefaciens strain QST 713 (Serenade Opti) Bayer PER88559	BM 01	Biological	NR	A	ALL (excl. VIC)	Permitted in cherries (field) for the suppression of Blossom Blight/Brown Rot (*Monilinia fructicola, M.laxa*), Bacterial Canker (*Pseudomonas* spp.), Brown Spot (*Alternaria alternata*), Bacterial Spot (*Xanthomonas* spp.) and **Botrytis Grey Mould** (*Botrytis cinerea*). Apply as a preventative treatment prior to disease development. Re-treat at 3-7 day intervals. Number of applications not specified.	-
Fenhexamid (Teldor) PER88787	17	Protectant	1 G:14	A	ALL (excl. VIC)	Permitted in cherries for control of **Botrytis Grey Mould**. Apply as a preventative treatment prior to the onset of disease. Do not use more than 2 applications per crop. Do not apply less than 7 days after the initial treatment.	-
Fludioxonil (Scholar) Syngenta	12	Post-Harvest	NR	A	ALL	Registered in stone fruit as a post-harvest treatment for control of Brown Rot (*Monilinia* spp.), **Grey Mould** (*Botrytis cinerea*) and Rhizopus Rot (*Rhizopus* spp.) Apply as a post-harvest dip for 30-60 seconds or as a drench for a minimum of 30 seconds.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
BLAD (Problad Plus)	BM 01	Biological	NR	P-A	ALL	Registered in cherries for suppression of Brown Rot / Blossom Blight. US registration for control of **Botrytis** in grapes, strawberries, tomatoes and ornamentals.	-
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	1	P-A	ALL	Registered in stone fruit for control of Blossom Blight, Shot Hole and Brown Rot. US registration for control of Botrytis in almonds, artichoke, berries, brassica vegetables, brassica leafy greens, cherries, dill seed, pome fruit, small vine climbing fruit (except Fuzzy Kiwifruit), ginseng, herbs, hops, melons, pistachio, fruiting vegetables and root vegetables.	-
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	7+11	Protectant & Curative	2	P-A	ALL	Registered in cherries for control of Blossom Blight / Brown Rot. US registration for control of Botrytis in stone fruit.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Hort Innovation project ST20005 generated data to support a label registration. APVMA submission in 2022/23 for control of **Botrytis** in cherries.	R3
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Chitin synthase inhibitor prevents cell wall formation		P		Registered for control of **Grey Mould** and Powdery Mildew in grapes and berries, and control of Powdery Mildew and Alternaria in Apples. US registration for control of **Botrytis** and Brown Rot in stone fruit. Nufarm are planning a label extension to include use in fruiting vegetables, almonds, stone fruit and avocado. Hort Innovation project ST20005 evaluated Intervene and efficacy data was provided to Nufarm in support of a future label extension in cherries for Botrytis.	-
Aureobasidium pullulans (Botector) Nufarm	BM 02	Biological	NR	P		Registered for control of **Botrytis** and suppression of Anthracnose, Phomopsis and Rhizopus in berries, control of Botrytis and suppression of Sclerotinia in fruiting vegetables and cucurbits, and control of **Botrytis** in grapes. US registration for control of **Botrytis** in berries, grapes, pome fruit and tomato and for control of Blossom Blight / Brown Rot in stone fruit.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Cyprodinil (Solaris) Adama	9	Protectant & Curative		P		Registered for control of **Botrytis** in almonds.	-
Cyprodinil + Fludioxonil (Switch) Syngenta	9+12	Protectant		P		Registered for control of **Grey Mould** in alliums, cucumber, cut flower, grapes, green beans, green peas, lettuce, ornamentals, snow peas, strawberries and sugar snap peas.	R3
Isotianil (Routine 200SC) Bayer	P03	Protectant & Curative		P		Registered for control of Yellow Sigatoka and Common Leaf Speckle in bananas.	-
Fenpyrazamine (Prolectus) Sumitomo	17	Protectant & Curative		P		Registered for ***Botrytis*** control in grapes. US registration for control of ***Botrytis*** in berries, ginseng, lettuce, pistachio, small fruit vine climbing (except fuzzy kiwifruit) and ornamentals.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New active in development from Corteva with activity on Septoria, Powdery Mildew, **Botrytis**, Anthracnose, Alternaria, Scab, Monilinia, Rust and Mycosphaerella spp. Scheduled for JMPR evaluation in 2023.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas and Grey Mould and Powdery Mildew in grapes. US registration for control of **Botrytis** in almonds, brassica leafy greens, bulb vegetables, grapes, pistachio and stone fruit.	R3
Isofetamid (Kenja) ISK / AgNova	7	Protectant & Curative		P		Registered for control of Botrytis Grey Mould in berries. US registration for control of Anthracnose in low-growing berries.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Brown Spot (*Alternaria alternata*) **Priority: Moderate**							
Rated as a high priority in NSW, a moderate priority in SA, and as a low priority in VIC and TAS. Brown Spot is a problem disease in wetter growing areas. Good canopy management sand orchard floor management should be employed to increase airflow. Maintaining crop health through nutrition and effective irrigation management will also help trees to resist infection.							
Bacillus amyloquefaciens strain QST 713 (Serenade Opti) Bayer PER88559	BM 01	Biological	NR	A	ALL (excl. VIC)	Permitted in cherries (field) for the suppression of Blossom Blight/Brown Rot (*Monilinia fructicola, M.laxa*), Bacterial Canker (*Pseudomonas* spp.), **Brown Spot** (*Alternaria alternata*), Bacterial Spot (*Xanthomonas* spp.) and Botrytis Grey Mould (*Botrytis cinerea*). Apply as a preventative treatment prior to disease development. Re-treat at 3-7 day intervals. Number of applications not specified.	-
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	1	P-A	ALL	Registered in stone fruit for control of Blossom Blight, Shot Hole and Brown Rot. Registered for suppression of Alternaria Leaf Blotch in apples and control of *Alternaria passiflorae* in passionfruit.	-
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	2	P-A	ALL	Registered in cherries for control of Blossom Blight / Brown Rot. US registration for control of Botrytis in stone fruit. Registered for control of **Alternaria Leaf Spot** in almonds.	-
Penthiopyrad (Fontelis) Corteva	7	Protectant	NR	P-A	ALL	Registered in stone fruit for control of Brown Rot / Blossom Blight (*Monilinia* spp.) and Scab / Freckle (*Cladosporium carpophilum*, *Venturia carpophila*). Registered for suppression of ***Alternaria*** **spp.** in pome fruit, onions, shallots, spring onions, fruiting vegetables and root and tuber vegetables.	-
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Chitin synthase inhibitor prevents cell wall formation		P		Registered for control of Grey Mould and Powdery Mildew in grapes and berries, and control of Powdery Mildew and **Alternaria** in Apples. US registration for control of Botrytis and Brown Rot in stone fruit. Nufarm are planning a label extension to include use in fruiting vegetables, almonds, stone fruit and avocado.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of *Botrytis* in grapes 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.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New active in development from Corteva with activity on Septoria, Powdery Mildew, Botrytis, Anthracnose, **Alternaria**, Scab, Monilinia, Rust and Mycosphaerella spp. Scheduled for JMPR evaluation in 2023.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas and Grey Mould and Powdery Mildew in grapes. US registration for control of **Alternaria** in almond, Brassica leafy greens, bulb vegetables, cucurbits, pistachio, tree nuts and sunflower.	R3
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of ***Alternaria sp.*** in potato. Hort Innovation project ST20005 is generating data to support a label registration for control of Botrytis in stone fruit.	R3
Shot Hole (*Stigmina carpophila*) **Priority: Moderate**							
Rated as a high priority in SA, a moderate priority in VIC and NSW, and as a low priority in TAS. Shot-Hole can affect all above ground parts of the tree, although the most noticeable symptoms are evident on the leaves. Infection causes necrotic spots to form on the leaf, which subsequently dry up and fall away leaving characteristic holes. Control options include maintaining airflow in the orchard, removal of diseased plant tissue and the use of protectant fungicides.							
Chlorothalonil (Bravo)	M5	Protectant	7	A	ALL	Registered in cherries for control of Brown Rot / Blossom Blight, **Shot-Hole**, Stone Fruit Rust and Transit Rot. Apply at bud-swell, bud-burst, shuck fall and cap fall. Apply every 10-14 days. Number of applications not specified.	R3
Copper (Cu) present as Copper Ammonium Acetate	M1	Protectant	1	A	ALL	Registered in cherries for control of **Shot Hole** and Freckle. Spray when buds are swelling but before and within 1 week of bud opening. Number of applications not specified.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Copper (Cu) present as Copper Hydroxide	M1	Protectant	1	A	ALL	Registered in cherries for control of **Shot Hole** and Freckle. Spray when buds are swelling but before and within 1 week of bud opening. Number of applications not specified.	-
Copper (Cu) present as Cuprous Oxide	M1	Protectant	1	A	ALL	Registered in cherries for control of **Shot Hole**. Spray when buds are swelling but before and within 1 week of bud opening. Number of applications not specified.	-
Copper (Cu) present as Copper Oxychloride	M1	Protectant	1	A	NSW, VIC, TAS, SA & WA	Registered in stone fruit for control of Blossom Blight, Freckle, Rust, Leaf Curl and **Shot Hole**. Spray when buds are swelling but before and within 1 week of bud opening. Number of applications not specified.	-
Copper (Cu) present as Tribasic Copper Sulfate	M1	Protectant	1	A	ALL	Registered in cherries for control of **Shot Hole** and Bacterial Gummosis. Spray when buds are swelling but before and within 1 week of bud opening. Number of applications not specified.	-
Dithianon (Delan) BASF	M9	Protectant	21	A	ALL	Registered in stone fruit for control of **Shot Hole** and Scab / Peach Blight. Apply according to local recommendations, at leaf fall and early to mid-blossoming. Number of applications not specified.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	1	A	ALL	Registered in stone fruit for control of Blossom Blight, **Shot Hole** and Brown Rot. Apply as part of a Shot Hole program at intervals of 10-14 days starting at early white bud. Apply a maximum of 2 applications per season.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in stone fruit (except Wilson Plums) for control of Brown Rot, Freckle, Rust and **Shot Hole**. Apply at early bloom, then repeat at mid to full bloom, at petal fall, and at shuck fall. Continue with a protective spray program at 2 week intervals. Number of applications not specified.	R2
Metiram (Polyram) BASF	M3	Protectant	14	A	ALL	Registered in stone fruit for control of Rust and **Shot Hole**. Apply the first spray at petal fall, followed by 3 further applications at 10-14 day intervals. In WA only, apply the first spray at white bud, then petal fall, followed by three further applications at 10-14 day intervals.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Thiram	M3	Protectant	7	A	ALL	Registered in stone fruit for control of Brown Rot (Fruit) (*Monilinia fructicola*), Freckle (Apricot) (*Venturia carpophila*) and **Shot-Hole** (*Stigmina carpophila*). Apply early full bloom, after bud swell copper sprays and again 4 and 8 weeks later. (Apply 2 weeks after shuck fall for susceptible varieties). Number of applications not specified.	R2
Ziram	M3	Protectant & Curative	7	A	ALL	Registered in stone fruit (except apricots) for control of Blossom Blight, Brown Rot, **Shot Hole**, Freckle and Leaf Curl. Apply at mid full bloom, early petal fall and at shuck fall. Apply cover sprays at 14 day intervals after fruit commences to ripen. Also apply at 21 and 7 days before harvest. Number of applications not specified.	R2
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	2	P-A	ALL	Registered in cherries for control of Blossom Blight / Brown Rot. US registration for control of Botrytis in stone fruit. Registered for control of **Shot Hole** in almonds.	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative		P		Registered in almonds for control of **Shot Hole**.	R3
Cyprodinil (Solaris) Adama	9	Protectant & Curative		P		Registered in almonds for control of **Shot Hole**.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot in bananas and Grey Mould and Powdery Mildew in grapes. US registration for control of **Shot Hole** in almonds and stone fruit.	R3
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. US registration for control of **Shot Hole** in tree nuts and stone fruit.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Crown Gall (*Agrobacterium tumefaciens*) **Priority: Moderate**							
Rated as a moderate priority in VIC, TAS and SA, and as a low priority in NSW. Galls form in the crown of the plant and on the roots. If infection occurs in young plants, it may cause trees to be unthrifty and die. Control can be achieved through strict hygiene with pruning and grafting tools and with the use of NoGall as a protective treatment for transplants. Inspect nursery stock prior to planting and avoid unnecessary damage to root systems.							
Agrobacterium radiobacter var. *radiobacter* (NoGall) BASF	-	Biological / Protectant / Pre-Planting	NR	A	ALL	Registered in stone fruit for control of **Crown Gall**. Apply as a pre-planting dip (seeds, seedlings, cuttings).	-
Bacillus amyloliquefaciens Strain QST 713 (Serenade Prime) Bayer	BM 02	Biological Soil Ameliorant	NR	P-A	ALL	Available in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Registered for suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-
Phytophthora Trunk & Stem Canker (*Phytophthora cinnamomi*) **Priority: Moderate**							
Rated as a moderate priority in VIC and NSW, and as low priority in SA and TAS. Cankers often form at a wound site in the branch. The infection causes localised necrosis and lesions, which can lead to the death of branches and will reduce overall tree health if left unchecked. Select well drained soils and maintain/improve soil structure to reduce susceptibility to the disease. Management options include avoidance of pruning and other types of wounds and removing infected tissue in conjunction with copper treatment.							
Bacillus amyloliquefaciens Strain QST 713 (Serenade Prime) Bayer	BM 02	Biological Soil Ameliorant	NR	P-A	ALL	Available in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Registered for suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in cherries for control of Bacterial Spot, Bacterial Canker, Leaf Curl and Shot Hole. Registered in nectarines, peaches and plums for control of **Phytophthora Stem Canker**.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Mandipropamid (Revus) Syngenta	40	Protectant		P		Registered for control of Downy Mildew in grapes, lettuce, leafy vegetables and oilseed poppies. US registration for control of **Phytophthora** in various crops, including as a foliar application for protection of citrus from Phytophthora Root Rot.	-
Metalaxyl M (Ridomil Gold 25G) Syngenta	4	Protectant & Curative		P		Registered for control of **Phytophthora Trunk & Stem Canker** in macadamia and peaches.	-
Oxathiapiprolin (Zorvec Enicade) Corteva	49	Protectant		P		Registered for control of Downy Mildew in bulb vegetables, brassicas, cucurbits, leafy vegetables and poppies. US registration for control of **Phytophthora Canker** and Brown Rot in citrus.	-
Phosphorous Acid	33	Protectant & Curative		P		Registered for control of **Phytophthora Root Rot** in avocados, citrus, walnuts and macadamia nuts.	-
Little Cherry Virus **Necrotic Ring Spot Virus** **Priority: Moderate**							
Rated as moderate priorities in VIC and TAS, and as moderate priorities in NSW and SA. The effects of viruses on growth and yield of fruit are most severe in young trees. Virus-free propagation materials should be used to establish the orchard. Note that Little Cherry Virus is a notifiable disease in some states.							
No control measures available							
Transit Rot - Post Harvest (*Rhizopus stolonifera*) **Priority: Moderate**							
Rated as a moderate priority in NSW and TAS, and as a low priority in VIC and SA. Transit Rot appears after harvest and can cause sporadic loss of fruit in humid conditions. Use good packing shed hygiene and sanitation and post-harvest fungicide treatments to avoid disease onset during transportation and storage.							
Bromo Chloro Dimethyl Hydantoin (BCDMH)	-	Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered in fruit as a post-harvest treatment for control of External Rot Causing Organisms. Post-harvest spray or dip. Minimum contact time 60 seconds. Can also be used as a general disinfectant for equipment.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Chlorine	-	Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered in fruit as a post-harvest treatment for control of bacteria and fungi. Post-harvest spray. Must make contact with the fruit for at least 30 seconds. Can also be used as a general disinfectant for equipment.	-
Chlorothalonil (Bravo)	M5	Protectant	7	A	ALL	Registered in cherries for control of Brown Rot / Blossom Blight, Shot-Hole, Stone Fruit Rust and **Transit Rot**. Apply at bud-swell, bud-burst, shuck fall and cap fall. Apply every 10-14 days. Number of applications not specified.	R3
Fludioxonil (Scholar) Syngenta	12	Protectant / Post-Harvest	NR	A	ALL	Registered in stone fruit as a post-harvest treatment for control of Brown Rot (*Monilinia* spp.), Grey Mould (*Botrytis cinerea*) and **Rhizopus Rot** (*Rhizopus* spp.) Apply as a post-harvest dip for 30-60 seconds or as a drench for a minimum of 30 seconds.	R3
Iodine	M	Protectant / Post-Harvest	NR	A	ALL	Registered in stone fruit as a post-harvest dip for control of bacteria and fungi. Dip the fruit for a minimum of 1 minute.	-
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	1	P-A	ALL	Registered in stone fruit for control of Blossom Blight, Shot Hole and Brown Rot. Registered for suppression of Hull Rot (***Rhizopus* spp.**) in almonds.	-
Aureobasidium pullulans (Botector) Nufarm	-	Biological	NR	P		Registered for suppression of ***Rhizopus* spp.** in berries.	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative		P		Registered for suppression of Hull Rot (***Rhizopus* spp.**) in almonds.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Leaf Curl (*Taphrina cerasi*) **Priority: Low**							
Rated as a low priority in all states. Leaf Curl, if left uncontrolled, can destroy new leaves in spring and cause shoot dieback and loss of yield. If unchecked over several years, it will gradually weaken the tree until it dies. The fungus over-winters on the surface of trees and primary infection occurs at bud swell as the leaf scale's part. Good control depends on reducing the population of the over-wintering phase and protecting the newly emerging leaves. The disease is favoured by cool, wet conditions and can be particularly severe in districts having cool, wet springs. Secondary infections can occur throughout spring if favourable weather conditions persist.							
Copper (Cu) present as Copper Oxychloride	M1	Protectant	1	A	ALL	Registered in stone fruit for control of Blossom Blight, Freckle, Rust, **Leaf Curl**, Shot Hole, Bacterial Spot and Bacterial Canker. Apply at early bud-swell. Additional applications in autumn when leaves begin to fall will improve control. Number of applications not specified.	-
Ziram	M3	Protectant & Curative	7	A	ALL	Registered in stone fruit (except apricots) for control of Blossom Blight, Brown Rot, Shot Hole, Freckle and **Leaf Curl**. Apply at mid full bloom, early petal fall and at shuck fall. Apply cover sprays at 14 day intervals after fruit commences to ripen. Also apply at 21 and 7 days before harvest. Number of applications not specified.	R2
Chlorothalonil (Bravo)	M5	Protectant	7	P-A	ALL	Registered in cherries for control of Brown Rot / Blossom Blight, Shot-Hole, Stone Fruit Rust and Transit Rot. Registered for control of **Leaf Curl** in peaches.	R3
Dithianon (Delan) BASF	M9	Protectant	21	P-A	ALL	Registered in stone fruit for control of Shot Hole and Scab / Peach Blight. Registered for control of **Leaf Curl** in nectarines and peaches.	R3
Dodine (Syllit) Campbell	U12	Protectant & Curative		P		Registered for control of **Leaf Curl** in nectarines and peaches.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered in bananas for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot. US registration for control of **Peach Leaf Curl** in stonefruit.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Rust (*Tranzschelia discolor*) **Priority: Low**							
Rated as a low priority in all states. Rust causes spots on the upper and lower sides of the leaf, and if left uncontrolled can lead to premature leaf-fall. Defoliation can lead to yield losses and general decline in tree health. Management options include selection of less susceptible varieties, improving airflow in the orchard, and close monitoring and removal of diseased plant tissue in conjunction with protectant fungicides.							
Chlorothalonil (Bravo)	M5	Protectant	7	A	ALL	Registered in cherries for control of Brown Rot / Blossom Blight, Shot-Hole, **Stone Fruit Rust** and Transit Rot. Apply at bud-swell, bud-burst, shuck fall and cap fall. Apply every 10-14 days. Number of applications not specified.	R3
Copper (Cu) present as Copper Oxychloride	M1	Protectant	1	A	ALL	Registered in stone fruit for control of Blossom Blight, Freckle, **Rust**, Leaf Curl, Shot Hole, Bacterial Spot and Bacterial Canker. Apply from late bud-swell to early blossom. Number of applications not specified.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in stone fruit (except Wilson Plums) for control of Brown Rot, Freckle, **Rust** and Shot Hole. Apply at early bloom, then repeat at mid to full bloom, at petal fall, and at shuck fall. Continue with a protective spray program at 2 week intervals. Number of applications not specified.	R2
Metiram (Polyram) BASF	M3	Protectant	14	A	ALL	Registered in stone fruit for control of **Rust** and Shot Hole. Apply the first spray at petal fall, followed by 3 further applications at 10-14 day intervals. In WA only, apply the first spray at white bud, then petal fall, followed by three further applications at 10-14 day intervals.	R2
Sulphur	M2	Protectant	NR	A	NSW, VIC, SA, WA & TAS	Registered in stone fruit (except apricots) for control of **Rust**. Apply 4 weeks after petal fall then as cover sprays. Number of treatments not specified.	-
Dithianon (Delan) BASF	M9	Protectant	21	P-A	ALL	Registered in stone fruit for control of Shot Hole and Scab / Peach Blight. Registered for control of **Rust** in apricots, nectarines and peaches.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative		P		Registered in almonds for control of **Rust**.	R3
Cyprodinil (Solaris) Adama	9	Protectant & Curative		P		Registered in almonds for control of **Rust**.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed for registration in Australia, with activity on *Septoria*, Powdery Mildew, *Botrytis*, Anthracnose, *Alternaria*, Scab, *Monilinia*, **Rust** and *Mycosphaerella* spp. Scheduled for JMPR evaluation in 2023.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered in bananas for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot. US registration for control of **Rust** in stonefruit.	R3
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered in almonds for control of Alternaria Leaf Spot, Black Spot, Brown Rot, Nut Scab, Shot-Hole and **Stone Fruit Rust**. US registration for control of **Rust** in stone fruit.	-
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 *Alternaria*, *Monilinia*, ***Tranzschelia*** and *Wilsonomyces* in stone fruit.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Bacterial Spot (*Xanthomonas arboricola pv pruni*) **Priority: Low**							
Rated as a low priority in VIC, TAS and SA, and as a moderate priority in NSW. Bacterial Spot reduces marketable yield as a result of direct infection of fruit, although the disease can also affect leaves and branches and can cause extensive loss of tree parts in severe cases. Control options are limited. Plant trees into sheltered sites where wind damage is low, selection of planting sites with good drainage, irrigation management to avoid excessive watering and prune and shape trees to maintain good airflow. Destroy neglected trees nearby that can act as an inoculum source.							
Bacillus amyloquefaciens strain QST 713 (Serenade Opti) Bayer PER88559	BM 01	Biological	NR	A	ALL (excl. VIC)	Permitted in cherries (field) for the suppression of Blossom Blight/Brown Rot (*Monilinia fructicola, M. laxa*), Bacterial Canker (*Pseudomonas* spp.), Brown Spot (*Alternaria alternata*), **Bacterial Spot** (*Xanthomonas* spp.) and Botrytis Grey Mould (*Botrytis cinerea*). Apply as a preventative treatment prior to disease development. Re-treat at 3-7 day intervals. Number of applications not specified.	-
Copper (Cu) present as Copper Oxychloride	M1	Protectant	1	A	ALL	Registered in stone fruit for control of Blossom Blight, Freckle, Rust, Leaf Curl, Shot Hole, **Bacterial Spot** and Bacterial Canker. Apply at white bud stage. Number of applications not specified.	-
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered for the suppression of Bacterial Spot (*Xanthomonas campestris*) in tomatoes.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of *Botrytis* in grapes and strawberries. US registration for control of ***Xanthomonas* spp.** in brassica leafy vegetables, citrus, fruiting vegetables, leafy vegetables, stone fruit, root and tuber vegetables and tree nuts.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Freckle & Scab (*Cladosporium carpophilum*) **Priority: Low**							
Rated as a low priority in all states. Infections occur during wet and humid weather during spring and summer, causing defoliation and scabbing of fruit. Management options include keeping an open tree canopy, selection of planting sites with good drainage, irrigation management to avoid excessive watering, pruning out infected shoots and using a protectant fungicide program.							
Copper (Cu) present as Copper Ammonium Acetate	M1	Protectant	1	A	ALL	Registered in cherries for control of Shot Hole and **Freckle**. Apply from late bud-swell to early blossom. Number of applications not specified.	-
Copper (Cu) present as Copper Hydroxide	M1	Protectant	1	A	ALL	Registered in cherries for control of Shot Hole and **Freckle**. Apply from late bud-swell to early blossom. Number of applications not specified.	-
Copper (Cu) present as Copper Oxychloride	M1	Protectant	1	A	NSW, VIC, TAS, SA & WA	Registered in stone fruit for control of Blossom Blight, **Freckle**, Rust, Leaf Curl and Shot Hole. Apply from late bud-swell to early blossom. Number of applications not specified.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in stone fruit (except Wilson Plums) for control of Brown Rot, **Freckle**, Rust and Shot Hole. Apply at early bloom, then repeat at mid to full bloom, at petal fall, and at shuck fall. Continue with a protective spray program at 2 week intervals. Number of applications not specified.	R2
Penthiopyrad (Fontelis) Corteva	7	Protectant	NR	A	ALL	Registered in stone fruit for control of Brown Rot / Blossom Blight (*Monilinia* spp.) and **Scab / Freckle** (*Cladosporium carpophilum*, *Venturia carpophila*). Use a re-treatment interval of 7-14 days. Do not use more than 3 applications per season, with no more than 2 consecutive applications.	-
Thiram	M3	Protectant	7	A	ALL	Registered in stone fruit for control of Brown Rot (Fruit) (*Monilinia fructicola*), **Freckle** (Apricot) (*Venturia carpophila*) and Shot-Hole (*Stigmina carpophila*). Apply early full bloom, after bud swell copper sprays and again 4 and 8 weeks later. (Apply 2 weeks after shuck fall for susceptible varieties). Number of applications not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Ziram	M3	Protectant & Curative	7	A	ALL	Registered in stone fruit (except apricots) for control of Blossom Blight, Brown Rot, Shot Hole, **Freckle** and Leaf Curl. Apply at mid full bloom, early petal fall and at shuck fall. Apply cover sprays at 14 day intervals after fruit commences to ripen. Also apply at 21 and 7 days before harvest. Number of applications not specified.	R2
Chlorothalonil (Bravo)	M5	Protectant	7	P-A	ALL	Registered in cherries for control of Brown Rot / Blossom Blight, Shot-Hole, Stone Fruit Rust and Transit Rot. Registered for control of **Freckle** in apricots.	R3
Dithianon (Delan) BASF	M9	Protectant	21	P-A	ALL	Registered in stone fruit for control of Shot Hole and Scab / Peach Blight. Registered for control of **Freckle** in apricots, nectarines and peaches.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	1	P-A	ALL	Registered in stone fruit for control of Blossom Blight, Shot Hole and Brown Rot. US registration for control of **Scab** in almonds, cherries, citrus, tree nuts and pecans.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P		Registered for control of *Botrytis* in grapes and strawberries. US registration for control of **Scab** in tree nuts.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed for registration in Australia, with activity on Septoria, Powdery Mildew, Botrytis, Anthracnose, Alternaria, **Scab**, Monilinia, Rust and *Mycosphaerella* spp. Due for registration in 2023.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Registered in bananas for control of Yellow Sigatoka, Leaf Speckle and Cordana Leaf Spot. US registration for control of **Scab** in stonefruit.	R3
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered in almonds for control of Alternaria Leaf Spot, Black Spot, Brown Rot, **Nut Scab**, Shot-Hole and Stone Fruit Rust. US registration for control of **Scab** in stone fruit.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
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 **Scab** in stone fruit and tree nuts.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered for control of various diseases in grapes, berries, leafy vegetables, lettuce and potato. US registration for control of **Scab** in cucurbits. Hort Innovation project ST20005 is generating data to support a label registration for control of Botrytis in stone fruit.	R3
Fungal Gummosis (*Botryosphaeria dothidea*) **Priority: Low**							
Rated as a low priority in all states. Pruning hygiene is a key control measure, as well as monitoring and removal of infected tissue. No fungicide controls are available.							
No control options available.							
Silver Leaf (*Chondrostereum purpureum*) **Priority: Low**							
Rated as a low priority in VIC, NSW and TAS, and as a moderate priority in SA. Silver Leaf is favoured by damp, humid conditions. Severe infections can lead to leaf-fall and death of branches or whole trees. Control by careful pruning and using wound dressings. Avoid winter pruning, particularly on damp, overcast days.							
Tebuconazole	3	Protectant & Curative	NR	A	ALL	Registered in cherries as a pruning wound dressing for control of **Silver Leaf**. Apply only during the winter dormant period on fresh pruning cuts. Apply thickly to dry wound surface with a paint brush or applicator brush on the same day as the pruning cut is made.	R3
Iodocarb + Cyproconazole (Pruning Wound Dressing)	28+3	Protectant		P		Registered as a pruning wound dressing for control of **Silverleaf Fungus** in apricots, peaches and plums.	R3

4.2 Insect and mite pests of cherries

4.2.1 Insect and mite pest priorities

Common name	Scientific name
High	
Black Cherry Aphid	*Myzus cerasi*
European Earwig	*Forficula auricularia*
Queensland Fruit Fly	*Bactrocera tryoni*
Two Spotted Mite	*Tetranychus urticae*
Rust Mites	Eriophyidae
Western Flower Thrips	*Frankliniella occidentalis*
Plague Thrips	*Thrips imaginis*
Pear & Cherry Slug	*Caliroa cerasi*
Moderate	
Mediterranean Fruit Fly	*Ceratitis capitata*
Black Peach Aphid	*Brachycaudus persicae*
Dried Fruit Beetle	*Carpophilus* spp.
Fuller's Rose Weevil	*Asynonychus cervinus*
Garden Weevil	*Phlyctinus callosus*
Fruit Tree Borer	*Maroga melanostigma*
Light Brown Apple Moth	*Epiphyas postvittana*
Oriental Fruit Moth	*Cydia molesta*
Scale Insects	Coccidae
Low	
Onion Thrips	*Thrips tabaci*
Green Peach Aphid	*Myzus persicae*
Wooly Aphid	*Eriosoma* spp.
Apple Weevil	*Otiorhynchus cribricollis*
Plague Soldier Beetle	*Chauliognathus lugubris*
Paropsis Beetle	*Paropsis* spp.
Red-Shouldered Leaf Beetle	*Monolepta australis*
Bryobia Mite	*Bryobia praetiosa*

Common name	Scientific name
European Red Mite	*Panonychus ulmi*
Peach Silver Mite	*Aculus fockeui*
Citrophilous Mealybug	*Pseudococcus calciolariae*
Long-Tailed Mealybug	*Pseudococcus longispinus*
Apple Dimpling Bug	*Campylomma liebknechti*
Rutherglen Bug	*Nysius vinitor*
Katydid	*Caedicia* spp.
Green Treehopper	*Sextius virescens*
Jassids / Leafhoppers	*Cicadellidae* spp.
Cotton Bollworm	*Helicoverpa armigera*
Native Budworm	*Helicoverpa punctigera*
Codling Moth	*Cydia pomonella*
Orange Fruit Borer	*Isotenes miserana*
Painted Apple Moth	*Teia anartoides*
Tortricid Moth	*Epiphyas xylodes*
Fall Armyworm	*Spodoptera frugiperda*
Nematodes	*Nematoda*
Snails	*Gastropoda* spp.
Termites	Isoptera
Wingless Grasshopper	*Phaulacridium vittatum*
Leafminers	*Liriomyza* spp.

The high priority insect pests identified by the survey were Black Cherry Aphid, European Earwig, Queensland Fruit Fly, Two Spotted Mite, Rust Mites, Western Flower Thrips, Plague Thrips and Pear & Cherry Slug. Available and potential products for insect, mite and other pests are listed in Section 4.2.2.

The broad range of insect and mite pests in cherries increases the importance of adopting an Integrated Pest Management approach. Pest management strategies should aim to use multiple methods of control, including cultural, biological and chemical measures.

Resistance Management

Insecticide resistance is a risk to effective control for some insect groups, particularly if there is an over-reliance on a limited number of insecticides. Growers should adhere to the resistance

management strategies outlined on the CropLife website[5]. Growers should not exceed the maximum number of applications permitted on the insecticide label.

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

4.2.2 Available and potential products for priority insects and mites

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

Availability		Regulatory risk (refer to Appendix 7)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG
IPM – indicative overall impact on beneficials (based on the Cotton Pest Management Guide 2018-19 and cotton use patterns)			
VL – Very low; L – Low; M – Moderate; H – High; VH – Very High; - not specified			

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Black Cherry Aphid (*Myzus cerasi*) **Priority: High**								
Rated as a high priority in NSW, a moderate priority in VIC and TAS, and as a low priority in SA. Aphids are sap-sucking insects that can severely retard the growth of young trees. Damage is mainly restricted to the young, growing shoots. Honeydew can also lead to outbreaks of sooty mould on leaves and fruit. Integrated management involving preservation of beneficials and removing weed hosts in and around orchards should be used in conjunction with judicious use of insecticides.								
Diazinon	1B	Contact	14	A	ACT, NSW, SA & WA	Registered in stone fruit for control of Green Peach Aphid and **Black Cherry Aphid**. Apply at budswell and re-treat if pest numbers build up. Number of treatments not specified.	M Bee:VH	R3
Diazinon PER84533	1B	Contact	14	A	TAS	Permitted in cherries for control of **Black Cherry Aphid**. Apply at budswell and re-treat if pest numbers build up. Number of treatments not specified.	M Bee:VH	R3
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, **Aphids**, Caterpillars, Earwigs, Whitefly, Thrips and Leafhopper. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks. Number of treatments not specified.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Pirimicarb (Pirimor)	1A	Contact	2	A	ALL	Registered in stone fruit for control of Green Peach Aphid, Black Peach Aphid and **Cherry Aphid**. Apply at white bud or when aphids appear. Use a maximum of 2 non-consecutive applications per season.	VL Bee:VL	R3
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in fruit trees for control of **Aphids**, Thrips, Mealybug, Two Spotted Mite, Spider Mite and Whitefly. Apply as a cover spray. Number of treatments not specified.	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	21	A	ALL	Registered in stone fruit for control of Tuber Mealybug, Long Tailed Mealybug, **Black Cherry Aphid**, Black Peach Aphid and San Jose Scale. Monitor crops following petal fall. Commence applications at the onset of crawler emergence or when pest numbers reach an economic threshold. To ensure that there is sufficient foliage for product uptake do not apply prior to shuck fall. Apply a second application 14-21 days after the first application if required. Do not use more than 3 applications per crop, with no more than 2 applications made later than 21 days after shuck fall and with a minimum 14 days between applications.	M Bee:L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in stone fruit for control of Apple Dimpling Bug, **Cherry Aphid**, Green Peach Aphid and Black Peach Aphid. Apply when the pest reaches threshold levels. Aphids that are protected within curled leaves may not be controlled. Repeat applications at a 14 day interval if required. Do not use consecutive applications and do not exceed 2 applications per season.	M Bee:VH	-
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion	7	P-A	ALL	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, Light Brown Apple Moth, Oriental Fruit Moth, San Jose Scale and suppression of Mediterranean Fruit Fly and Queensland Fruit Fly.	M Bee:M	R2
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	7 NG	P-A	ALL	Registered in stone fruit for control of Queensland Fruit Fly, Mediterranean Fruit Fly and Carpophilus Beetle. Registered for control of Green Peach Aphid in peaches and nectarines.	M Bee:VH	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Imidacloprid (Confidor)	4A	Contact & Ingestion	21 NG	P-A	ALL	Registered in stone fruit for control of Green Peach Aphid and Black Peach Aphid.	M Bee:M	R2
Maldison (Fyfanon)	1B	Contact	3	P-A	NSW, ACT, VIC, TAS, SA & WA	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, European Red Mite and Oriental Fruit Moth.	H Bee:H	R3
Methomyl (Lannate)	1A	Contact	1	P-A	ALL	Registered in stone fruit for control of Thrips, Green Peach Aphid, Budworm and Monolepta Beetle.	H Bee:H	R2
Pymetrozine (Chess) Syngenta	9B	Contact & Ingestion	28	P-A	ALL	Registered in stone fruit for control of Black Peach Aphid and Green Peach Aphid.	L Bee:VL	R3
Afidopyropen (Versys) BASF	9D	Ingestion		P		Registered for control of **Aphids** in various vegetable crops. US registration for control of **Aphids** in stone fruit.	L Bee:L	-
Beauveria bassiana (Velifer) BASF	UNF	Biological	NR	P		Registered for suppression of Green Peach Aphid, Rose Aphid and Chrysanthemum Aphid in protected vegetables and ornamentals.	L Bee:L	-
Diafenthiuron + Cyantraniliprole (Minecto Forte) Syngenta	12A+28	Contact & Ingestion		P		Registered for control of various insects and mites in cucurbits and fruiting vegetables, including the control of Green Peach Aphid and Melon Aphid in cucurbits, and control of Green Peach Aphid in fruiting vegetables.	M Bee:VH	-
Botanical Oil (Eco-Oil)	-	Contact		P		Registered for control of **Aphids** in ornamentals, tomatoes, cucumbers, capsicums and strawberries.	L Bee:L	-
Dimpropyridaz (Axalion) BASF	TBC			P		BASF has applied for registration in leafy vegetables, brassica vegetables and fruiting vegetables, including cucurbits to control Whitefly, **Aphids** and Thrips. Pending regulatory approvals, first market introduction in Australia is expected early 2023.	-	-
Flonicamid (Mainman) UPL	29	Ingestion		P		Registered for control of Mealybugs in pome fruit, **Aphids** in potatoes, **Aphids** and Mirids in cotton, and **Aphids** and Silverleaf Whitefly in cucurbits. US registration for control of **Aphids** and Plant Bugs in stone fruit.	M Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022.Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, Green Peach Aphid and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and Green Peach Aphid in green beans, potatoes and sweet potatoes. US registration for control of **Aphids** and San Jose Scale in stone fruit.	L Bee:L	-
European Earwig (*Forficula auricularia*) **Priority: High**								
Rated as a high priority in NSW, VIC and SA, and as a moderate priority in TAS. Earwigs can cause significant damage to fruit and young trees. Surface chewing damage to cherries and stems is prevalent wherever fruit is in contact with shelter such as leaves or other fruit. Control methods are aimed at preventing migration from the ground into the tree.								
Chlorpyrifos (Lorsban)	1B	Contact	14	A	NSW, WA & ACT	Registered in stone fruit for control of **European Earwig.** Apply either as a foliar cover spray or spread as a prepared bait in spring. Treatments per season not limited.	H Bee:H	R1
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, Aphids, Caterpillars, **Earwigs**, Whitefly, Thrips and Leafhopper. Apply as a foliar spray when pests are present. Re-apply as necessary. Number of treatments not specified.	VH Bee:H	-
Indoxacarb (Avatar) FMC	22A	Ingestion	14	A	ALL	Registered in cherries for suppression of **European Earwig**, and for control of Oriental Fruit Moth, Inland Katydid, Light Brown Apple Moth, Pear & Cherry Slug, Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Wingless Grasshopper and Garden Weevil. Use not more than 3 applications per crop using a re-treatment interval of 10 days.	M Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Indoxacarb (Avatar) FMC PER11002	22A	Ingestion	14	A	NSW, SA, TAS & WA	Permitted in cherries for control of **European Earwig**. Apply a maximum of 2 applications per season with a minimum re-treatment interval of 10 days.	M Bee:H	R3
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms and other soil pests, and a foliar treatment for the control of chewing pests in various crops.	-	-
Queensland Fruit Fly (*Bactrocera tryoni*) **Mediterranean Fruit Fly** (*Ceratitis capitata*) **Priority: High**								
Queensland Fruit Fly are rated as a high priority in all states. Mediterranean Fruit Fly is rated as a high priority in TAS and SA, and as a low priority in NSW and VIC. Queensland Fruit Fly lay eggs in ripening fruit, subsequently hatching maggots that cause feeding damage to the flesh. A range of control measures should be implemented in order to control the pest and avoid fruit damage.								
4-(P-Acetoxyphenyl) -2-Butanone + Maldison	1B	Contact	NR	A	ALL	Registered in fruit trees for use as a trap for **Queensland Fruit Fly**. Used to detect the presence of Fruit Fly in the orchard to assist with making decisions about control.	H Bee:H	R3
4-(P-Acetoxyphenyl) -2-Butanone + Fipronil	2B	Contact	NR	A	ALL	Registered in fruit crops for population reduction and population monitoring of **Queensland Fruit Fly** and **Lesser Queensland Fruit Fly**. Single stations can be used for population monitoring. Control of fruit fly required placement of 16 stations per hectare and should be used in conjunction with regular insecticide cover sprays.	M Bee:VH	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion	7	A	ALL	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, Light Brown Apple Moth, Oriental Fruit Moth, San Jose Scale and suppression of **Mediterranean Fruit Fly** and **Queensland Fruit Fly**. Apply as part of a broader program involving other products for control of fruit fly, appropriate pest monitoring and farm hygiene. Apply when monitoring indicates fruit fly activity. Apply in rotation with insecticides from a different mode of action using a 7-10 day interval. Do not use consecutive applications and do not use more than 2 applications per season.	M Bee:M	R2
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	7 NG	A	ALL	Registered in stone fruit for control of **Queensland Fruit Fly, Mediterranean Fruit Fly** and Carpophilus Beetle. Apply 3 consecutive foliar sprays 7 days apart when monitoring indicates fruit fly activity.	M Bee:VH	R2
Dimethoate PER13859	1B	Contact / Post-harvest only	NR	A	ALL	Permitted in fruit fly host crops following the completion of harvest for control of **Fruit Fly**. Do not apply more than 2 applications per crop following harvest. Apply as a foliar spray to both fallen and retained fruit. Produce treated must not be harvested, collected or supplied for human or animal consumption.	H Bee:H	R1
Etofenprox (Trebon) Sipcam	3A	Contact	3 NG	A	ALL	Registered in stone fruit for control of **Queensland Fruit Fly** and **Mediterranean Fruit Fly**. Apply first application as maturity approaches (fruit turning colour) and the target pest numbers are at critical thresholds. Continue to monitor pest pressure and if re-application is needed, a minimum of 7 days is required between treatments. Do not use more than 3 applications per season.	VH Bee:H	-
Fipronil (Amulet) BASF	2B	Contact	NR	A	ALL	Registered in stone fruit for control of **Queensland Fruit Fly**. Commence application before fruit reach mature size and as soon as first fruit flies are present. Repeat applications at 7 day intervals, until all fruit is harvested. Number of treatments not specified.	M Bee:VH	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Maldison (Fyfanon)	1B	Contact / Bait	3	A	ALL	Registered in fruit trees for control of all **Fruit Fly** species excluding Mediterranean Fruit Fly. Mix with a protein lure and apply to the foliage, starting 6 weeks before normal ripening of the tree and repeat at 4-10 day intervals while fruit remains on the tree. Avoid contact of the bait with the fruit. Treatments per season not limited.	H Bee:H	R3
Pyrethrin (Pyganic) Sumitomo	3A	Contact	NR	A	ALL	Registered in stone fruit for control of **Fruit Fly**, Rutherglen Bug and Spiders. Use as a clean-up spray ton remove insects just prior to harvest. Apply a maximum of 3 sprays at 3 day intervals.	VH Bee:H	-
Spinetoram (Delegate) Corteva PER12590	5	Ingestion	3 NG	A	ACT, NSW, QLD & NT	Permitted in stone fruit for suppression of **Queensland Fruit Fly** and **Lesser Queensland Fruit Fly**. Apply as a foliar spray after stone set, depending on the pest pressure as determined by orchard scouting and fruit fly trapping. Do not apply more than 4 applications per season, with a minimum of 14 days between consecutive applications.	M Bee:VH	-
					WA	Permitted in stone fruit for suppression of **Mediterranean Fruit Fly**. Apply as a foliar spray after stone set, depending on the pest pressure as determined by orchard scouting and fruit fly trapping. Do not apply more than 4 applications per season, with a minimum of 14 days between consecutive applications.		
Spinosad (Naturalure) Corteva	5	Bait / Ingestion	NR	A	ALL	Registered in tree crops as a bait for **Queensland Fruit Fly** and **Mediterranean Fruit Fly**. Apply as either a band or a spot spray to the lower canopy of fruiting plants. Begin applications as soon as monitoring traps indicate flies are present and fruit is at a susceptible stage. Repeat applications every 7 days, re-applying sooner if rain washes off the deposit. Avoid spraying the fruit as phytotoxicity may occur.	L Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	A	ALL	Registered in stone fruit for control of Apple Weevil (*Otiorhynchus cribricollis*), Fuller's Rose Weevil (*Asynonychus cervinus*), Garden Weevil (*Phlyctinus callosus*), Oriental Fruit Moth (*Grapholita molesta*), **Mediterranean Fruit Fly** (*Ceratitis capitata*) and for suppression of Dried Fruit Beetle (*Carpophilus* spp.) Apply during fruit ripening period if fruit fly is present, using a re-treatment interval of 10 days. Do not use more than 3 applications per season.	L-M Bee:VH	-
Thiacloprid (Calypso) Bayer PER14562	4A	Contact & Ingestion	14 NG	A	WA	Permitted in stone fruit (excluding peaches) for control of **Mediterranean Fruit Fly**. Apply as a foliar spray when monitoring indicates fruit fly activity. Apply a maximum of 3 applications per season, with a minimum 14 days between consecutive applications.	M Bee:L	R2
Trichlorfon (Lepidex)	1B	Contact	2	A	QLD, NSW, VIC, WA & NT	Registered in stone fruit for control of **Queensland Fruit Fly**. Apply at start of stinging. Repeat at half concentration every 7-10 days. Number of treatments not specified.	H Bee:H	R2
Trichlorfon (Lepidex) PER80542	1B	Contact	2	A	SA	Permitted in stone fruit for control of **Queensland Fruit Fly** and **Mediterranean Fruit Fly**. Apply pre-harvest within 2 weeks of harvest. Number of treatments not specified.	H Bee:H	R2
Trichlorfon (Lepidex) PER14683	1B	Contact	7	A	ALL (excl. VIC)	Permitted in stone fruit for control of **Fruit Flies**. Apply at start of stinging. Repeat at half concentration every 7-10 days. Number of treatments not specified.	H Bee:H	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022.Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, Green Peach Aphid and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and Green Peach Aphid in green beans, potatoes and sweet potatoes. US registration for control of Aphids and San Jose Scale in stone fruit. Possible activity against fruit fly.	L Bee:L	-
Two Spotted Mite (*Tetranychus urticae*) **Rust Mites** (Eriophyidae) **Priority: High**								
Two Spotted Mites and Rust Mites are rated as a high priority in NSW and TAS, and as a low priority in VIC and SA. Occurrence tends to be highly seasonal. They damage the tree by causing leaves to turn brown and fall, leading to reduced yield and fruit quality. Management options include reducing dust in the orchard, promotion or introduction of predatory mites and judicious use of miticides while maintaining beneficial populations.								
Acequinocyl (Kanemite) UPL	20B	Contact & Ingestion	14 NG	A	ALL	Registered in stone fruit for control of **Two Spotted Mite.** Apply when mites appear. Use one application per season only.	L Bee:L	-
Clofentezine (Apollo) Adama	10A	IGR / Contact	21	A	ALL	Registered in stone fruit for control of **Two Spotted Mite,** European Red Mite and Bryobia Mite. Apply when the pest is evident but before the population reaches a level where economic damage is imminent. Do not use more than 1 application per season.	L Bee:L	-
Etoxazole (Paramite) Sumitomo	10B	IGR / Contact	7 NG	A	ALL	Registered in stone fruit for control of **Two Spotted Mite**, European Red Mite and Bryobia Mite. Apply at the first sign of mite crawlers. Do not use more than 1 application per season.	L Bee:VL	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Hexythiazox (Calibre) Nufarm	10A	IGR / Contact	3	A	ALL	Registered in stone fruit for control of **Two Spotted Mite** and European Red Mite. Apply when the pest is evident but before the population reaches a level where economic damage is imminent. Do not use more than 1 application per season.	L Bee:L	-
Milbemectin (Milbeknock) Sipcam	6	Ingestion	14 NG	A	ALL	Registered in stone fruit for control of **Two Spotted Mite**. Apply soon after mite numbers have reached economic threshold. Retreatment interval not less than 7 days. Do not use consecutive applications and use no more than 2 applications per season.	M Bee:VH	-
Petroleum Oil	-	Contact	1	A	NSW & QLD	Registered in stone fruit for control of **Two-Spotted Mite**. Apply during dormant period up to bud swell. Number of treatments not specified.	L Bee:L	-
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in fruit trees for control of Aphids, Thrips, Mealybug, **Two Spotted Mite**, Spider Mite and Whitefly. Apply as a cover spray. Number of treatments not specified.	L Bee:L	-
Propargite (Omite)	12C	Contact / Systemic	7	A	ALL	Registered in stone fruit for control of **Two Spotted Mite**. Apply as soon as mites appear. Treatments per season not limited.	M Bee:L	R3
Spiromesifen (Oberon) Bayer	23	Ingestion		P		ST20003 is generating data to support a label registration for control of **Mites** in stone fruit.Not currently registered in AU but under development with Bayer and Hort Innovation for multiple commodities. US registrations for **Mites** in various crops. Hort Innovation project	M Bee:VL	-
Beauveria bassiana (Velifer) BASF	UNF	Biological		P		Registered for suppression of **Two Spotted Mite** in protected vegetables and ornamentals and also has activity on Thrips, Aphids and Whitefly.	L Bee:L	-
Bifenazate (Acramite) UPL	20	Contact & Ingestion		P		Registered for control of **Two Spotted Mite** in apples, pears, apricots, nectarines, peaches, plums, almonds, fruiting vegetables, cucurbits, papaya and strawberries.	L Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Chlorfenapyr (Secure) BASF	13	Contact & Ingestion		P		Registered for control of **Two Spotted Mite** in apples, pears and peaches.	M Bee:H	-
Cyflumetofen (Danisaraba) BASF	25A	Contact		P		Registered for the control of various mite species in pome fruit, citrus, strawberries, grapes, fruiting vegetables, tree nuts and ornamentals. Species controlled are **Two Spotted Mite**, European Red Mite, Citrus Red Mite, Oriental Spider Mite and Bryobia Mite.	L Bee:L	-
Fenbutatin Oxide (Torque) BASF	12A	Contact		P		Registered for control of **Two Spotted Mite** in apples, pears, peaches, nectarines, hops, bananas and strawberries, and for the control of **Rust Mites** in citrus.	L Bee:L	R2
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, Mites and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Tebufenpyrad (Pyranica) Sipcam	21A	Contact & Ingestion		P		Registered for control of **Two Spotted Mite** in apples, pears, peaches and ornamentals.	M Bee:H	-
Western Flower Thrips (*Frankliniella occidentalis*) **Plague Thrips** (*Thrips imaginis*) **Onion Thrips** (*Thrips tabaci*) **Priority: High**								
Western Flower Thrips and Plague Thrips are rated as a high priority in VIC and NSW, and as a moderate priority in TAS and SA. Onion Thrips are rated as a high priority in VIC, and as a low priority in NSW, TAS and SA. Thrips will cause damage from flowering onwards. The nymphs cause scarring and dimpling damage through feeding on the flowers and developing fruit. Late season damage can be seen as bronzing on the fruit as it ripens.								
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, **Thrips** and Leafhopper. Apply as a foliar spray when pests are present. Re-apply as necessary. Number of treatments not specified.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Methomyl (Lannate)	1A	Contact	1	A	ALL	Registered in stone fruit for control of **Thrips**, Green Peach Aphid, Budworm and Monolepta Beetle. Apply at petal fall. Number of treatments not specified.	H Bee:H	R2
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in fruit trees for control of Aphids, **Thrips**, Mealybug, Two Spotted Mite, Spider Mite and Whitefly. Apply as a cover spray. Number of treatments not specified.	L Bee:L	-
Spinetoram (Delegate) Corteva	5	Ingestion	3 NG	A	ALL	Registered in stone fruit for control of Pear and Cherry Slug, Light Brown Apple Moth, Oriental Fruit Moth and **Western Flower Thrips**. Make 3 consecutive applications at either 3-5 day intervals when temperatures are greater than 20°C or 6-12 day intervals when temperatures are less than 20°C. Do not use more than 3 consecutive applications. Do not use more than 4 applications per season.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	A	ALL	Registered in stone fruit (except peaches) for control of Cherry Slug, Light Brown Apple Moth, **Western Flower Thrips** and Oriental Fruit Moth. Make 3 consecutive applications at either 3-5 day intervals when temperatures are greater than 20°C or 6-12 day intervals when temperatures are less than 20°C. Do not use more than 3 consecutive applications. Do not use more than 4 applications per season.	L Bee:H	-
Spirotetramat (Movento) Bayer PER84804	23	Ingestion	21	A	ALL (excl. VIC)	Permitted in stone fruit for control of **Western Flower Thrips**. Apply at first sign of infestation. Do not apply more than 2 applications per crop, with a minimum 14 days between treatments.	M Bee:L	-
Tau-Fluvalinate (Mavrik)	3A	Contact	NR	A	QLD, NSW, VIC, SA & WA	Registered in cherries for control of **Plague Thrips**. Apply just prior to or at the commencement of flowering when thrips are present. A second application may be required depending on pest pressure 10-14 days later. The second application must not be applied outside the bloom period.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of **Thrips** in cherries. First global application is proposed for 2023 for **Thrips**, Bugs, Mites and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Beauveria bassiana (Velifer) BASF	UN	Biological	NR	P		Registered for suppression of **Western Flower Thrips** in protected vegetables.	L Bee:L	-
Diafenthiuron + Cyantraniliprole (Minecto Forte) Syngenta	12A+28	Contact & Ingestion		P		Registered for control of various insects and mites in cucurbits and fruiting vegetables, including the suppression of **Western Flower Thrips**, Tomato Thrips and **Plague Thrips** in cucurbits and fruiting vegetables.	M Bee:VH	-
Dimpropyridaz (Axalion) BASF	TBC			P		BASF has applied for registration in leafy vegetables, brassica vegetables and fruiting vegetables, including cucurbits to control Whitefly, Aphids and **Thrips**. Pending regulatory approvals, first market introduction in Australia is expected early 2023.	-	-
Pear & Cherry Slug (*Caliroa cerasi*) **Priority: High**								
Rated as a high priority in all states. The larval stage feed voraciously on leaves, leading to defoliation and causing an offensive odour. Uncontrolled infestations will significantly impact on tree health and in severe cases can lead to loss of whole trees. Integrated management strategies are required, including weed control in and around the orchard, preservation of beneficial insects and judicious use of insecticides on the early population of slugs.								
Indoxacarb (Avatar) FMC	22A	Ingestion	14	A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, Inland Katydid, Light Brown Apple Moth, **Pear & Cherry Slug**, Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Wingless Grasshopper and Garden Weevil. Use not more than 3 applications per crop using a re-treatment interval of 10 days.	M Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Spinetoram (Delegate) Corteva	5	Ingestion	3 NG	A	ALL	Registered in stone fruit for control of **Pear and Cherry Slug**, Light Brown Apple Moth, Oriental Fruit Moth and Western Flower Thrips. Make 3 consecutive applications at either 3-5 day intervals when temperatures are greater than 20°C or 6-12 day intervals when temperatures are less than 20°C. Do not use more than 3 consecutive applications. Do not use more than 4 applications per season.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	A	ALL	Registered in stone fruit (except peaches) for control of **Cherry Slug**, Light Brown Apple Moth, Western Flower Thrips and Oriental Fruit Moth. Make 3 consecutive applications at either 3-5 day intervals when temperatures are greater than 20°C or 6-12 day intervals when temperatures are less than 20°C. Do not use more than 3 consecutive applications. Do not use more than 4 applications per season.	L Bee:H	-
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion	7	P-A	ALL	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, Light Brown Apple Moth, Oriental Fruit Moth, San Jose Scale and suppression of Mediterranean Fruit Fly and Queensland Fruit Fly.	M Bee:M	R2
Chlorantraniliprole (Altacor) FMC	28	Ingestion	14 NG	P-A	ALL	Registered in stone fruit for control of Oriental Fruit Moth and Light Brown Apple Moth.	L Bee:VL	-
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	P-A	ALL	Registered in stone fruit for control of Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Oriental Fruit Moth, Mediterranean Fruit Fly and for suppression of Dried Fruit Beetle.	L-M Bee:VH	-
Thiacloprid (Calypso) Bayer	4A	Contact & Ingestion	14 NG	P-A	ALL	Registered in stone fruit for control of **Oriental Fruit Moth**.	M Bee:L	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, Mites and **Caterpillars**. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Black Peach Aphid (*Brachycaudus persicae*) **Green Peach Aphid** (*Myzus persicae*) **Woolly Aphid** (*Eriosoma* spp.) **Priority: Moderate**								
Black Peach Aphid is rated as a high priority in NSW, a moderate priority in VIC and TAS, and as a low priority in SA. Green Peach Aphid is rated as a moderate priority in NSW, and a low priority in VIC, TAS and SA. Woolly Aphid is rated as a low priority in all states.								
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion	7	A	ALL	Registered in stone fruit for control of **Black Peach Aphid**, **Green Peach Aphid**, Light Brown Apple Moth, Oriental Fruit Moth, San Jose Scale and suppression of Mediterranean Fruit Fly and Queensland Fruit Fly. Apply as part of a broader program involving other products for control of fruit fly, appropriate pest monitoring and farm hygiene. Apply when monitoring indicates fruit fly activity. Apply in rotation with insecticides from a different mode of action using a 7-10 day interval. Do not use consecutive applications and do not use more than 2 applications per season.	M Bee:M	R2
Diazinon	1B	Contact	14	A	ACT, NSW, SA & WA	Registered in stone fruit for control of **Green Peach Aphid** and Black Cherry Aphid. Apply at bud swell and re-treat if pest numbers build up. Number of treatments not specified.	M Bee:VH	R3
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, **Aphids**, Caterpillars, Earwigs, Whitefly, Thrips and Leafhopper. Suitable for organic growers. Apply as a cover spray and re-apply as necessary every 2-3 weeks.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Imidacloprid (Confidor)	4A	Contact & Ingestion	21 NG	A	ALL	Registered in stone fruit for control of **Green Peach Aphid** and **Black Peach Aphid**. Apply at first sign of aphid infestation. Use a maximum of 3 applications per season.	M Bee:M	R2
Maldison (Fyfanon)	1B	Contact	3	A	NSW, ACT, VIC, TAS, SA & WA	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, European Red Mite and Oriental Fruit Moth. Apply at first sign of pest and repeat as necessary. Number of treatments not specified.	H Bee:H	R3
Methomyl (Lannate)	1A	Contact	1	A	ALL	Registered in stone fruit for control of Thrips, **Green Peach Aphid**, Budworm and Monolepta Beetle. Apply at petal fall. Number of treatments not specified.	H Bee:H	R2
Pirimicarb (Pirimor)	1A	Contact	2	A	ALL	Registered in stone fruit for control of **Green Peach Aphid**, **Black Peach Aphid** and Cherry Aphid. Apply at white bud or when aphids appear. Use a maximum of 2 non-consecutive applications per season.	VL Bee:VL	R3
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in fruit trees for control of **Aphids**, Thrips, Mealybug, Two Spotted Mite, Spider Mite and Whitefly. Apply as a cover spray. Number of treatments not specified.	L Bee:L	-
Pymetrozine (Chess) Syngenta	9B	Contact & Ingestion	28	A	ALL	Registered in stone fruit for control of **Black Peach Aphid** and **Green Peach Aphid**. Commence application when local pest thresholds are reached and make subsequent applications as necessary. Minimum retreatment interval 14 days. Do not use consecutive applications and do not use more than 2 applications per season.	L Bee:VL	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Spirotetramat (Movento) Bayer	23	Ingestion	21	A	ALL	Registered in stone fruit for control of Tuber Mealybug, Long Tailed Mealybug, Black Cherry Aphid, **Black Peach Aphid** and San Jose Scale. Monitor crops following petal fall. Commence applications at the onset of crawler emergence or when pest numbers reach an economic threshold. To ensure that there is sufficient foliage for product uptake do not apply prior to shuck fall. Apply a second application 14-21 days after the first application if required. Do not use more than 3 applications per crop, with no more than 2 applications made later than 21 days after shuck fall and with a minimum 14 days between applications.	M Bee:L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in stone fruit for control of Apple Dimpling Bug, Cherry Aphid, **Green Peach Aphid** and **Black Peach Aphid**. Apply when the pest reaches threshold levels. Aphids that are protected within curled leaves may not be controlled. Repeat applications at a 14 day interval if required. Do not use consecutive applications and do not exceed 2 applications per season.	M Bee:VH	-
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	7 NG	P-A	ALL	Registered in stone fruit for control of Queensland Fruit Fly, Mediterranean Fruit Fly and Carpophilus Beetle. Registered for control of **Green Peach Aphid** in peaches and nectarines.	M Bee:VH	R2
Afidopyropen (Versys) BASF	9D	Ingestion		P		Registered for control of **Aphids** in various vegetable crops. US registration for control of Aphids in stone fruit.	L Bee:L	-
Beauveria bassiana (Velifer) BASF	UNF	Biological	NR	P		Registered for suppression of **Green Peach Aphid**, Rose Aphid and Chrysanthemum Aphid in protected vegetables and ornamentals.	L Bee:L	-
Botanical Oil (Eco-Oil)	-	Contact		P		Registered for control of **Aphids** in ornamentals, tomatoes, cucumbers, capsicums and strawberries.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Dimpropyridaz (Axalion) BASF	TBC			P		BASF has applied for registration in leafy vegetables, brassica vegetables and fruiting vegetables, including cucurbits to control Whitefly, **Aphids** and Thrips. Pending regulatory approvals, first market introduction in Australia is expected early 2023.	-	-
Flonicamid (Mainman) UPL	29	Ingestion		P		Registered for control of Mealybugs in pome fruit, **Aphids** in potatoes, **Aphids** and Mirids in cotton, and **Aphids** and Silverleaf Whitefly in cucurbits. US registration for control of **Aphids** and Plant Bugs in stone fruit.	M Bee:VL	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022.Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, **Green Peach Aphid** and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and **Green Peach Aphid** in green beans, potatoes and sweet potatoes. US registration for control of **Aphids** and San Jose Scale in stone fruit.	L Bee:L	-
Dried Fruit Beetle (*Carpophilus* spp.) **Priority: Moderate**								
Rated as a high priority in NSW, a moderate priority in VIC, and as a low priority in TAS and SA. Dried Fruit Beetle can cause heavy fruit losses by boring into the ripening fruit and causing feeding damage and spread of Brown Rot. Hygiene in the orchard and in the packing shed is a critical measure to interrupt the pest life cycle.								
Bifenthrin (Talstar) PER82062	3A	Contact	1	A	ALL (excl. VIC)	Permitted in cherries for control of **Carpophilus Beetle**. Apply before beetles reach damaging levels. Us a minimum re-treatment interval of 10 days. Do not use more than 2 applications per season.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	7 NG	A	ALL	Registered in stone fruit for control of **Carpophilus Beetle**. Use 2 or 3 applications prior to harvest using 7 day re-treatment intervals.	M Bee:VH	R2
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	A	ALL	Registered in stone fruit for control of Apple Weevil (*Otiorhynchus cribricollis*), Fuller's Rose Weevil (*Asynonychus cervinus*), Garden Weevil (*Phlyctinus callosus*), Oriental Fruit Moth (*Grapholita molesta*), Mediterranean Fruit Fly (*Ceratitis capitata*) and for suppression of **Dried Fruit Beetle** (*Carpophilus* spp.) Apply during fruit ripening period if fruit fly is present, using a re-treatment interval of 10 days. Do not use more than 3 applications per season.	L-M Bee:VH	-
Pheromone Lures and Ethanol Based Co-Attractants (Carpophilus Catcha Trapping System)	-	Attract & Kill	NR	P-A	ALL	Registered in stone fruit for monitoring and control of **Carpophilus Beetle**.	VL Bee:VL	-
Fuller's Rose Weevil (*Asynonychus cervinus*) **Garden Weevil** (*Phlyctinus callosus*) **Apple Weevil** (*Otiorhynchus cribricollis*) **Priority: Moderate**								
Fuller's Rose Weevil and Garden Weevil are rated as a moderate priority in VIC and TAS, and as a low priority in NSW and SA. Apple Weevil is rated as a low priority in all states. Weevils tend to be a seasonal pest. Garden Weevils are the only weevil that damages the fruit. Fuller's Rose Weevil tend to damage the leaves, flowers and buds. Cultural practices that restrict weed growth under trees and stop fruiting limbs from contacting the ground are important control measures.								
Indoxacarb (Avatar) FMC	22A	Ingestion	14	A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, Inland Katydid, Light Brown Apple Moth, Pear & Cherry Slug, **Apple Weevil**, **Fuller's Rose Weevil**, **Garden Weevil**, Wingless Grasshopper and Garden Weevil. Use not more than 3 applications per crop using a re-treatment interval of 10 days.	M Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	A	ALL	Registered in stone fruit for control of **Apple Weevil** (*Otiorhynchus cribricollis*), **Fuller's Rose Weevil** (*Asynonychus cervinus*), **Garden Weevil** (*Phlyctinus callosus*), Oriental Fruit Moth (*Grapholita molesta*), Mediterranean Fruit Fly (*Ceratitis capitata*) and for suppression of Dried Fruit Beetle (*Carpophilus* spp.) Commence application before beetle populations reach damaging levels and re-treat at 10-14 day intervals. Do not use more than 3 applications per season.	L-M Bee:VH	-
Fruit Tree Borer (*Maroga melanostigma*) **Priority: Moderate**								
Rated as a moderate priority in NSW, VIC and TAS, and as a low priority in SA. Borers will attack trees that are unhealthy or have suffered wounds through pruning or weather damage. Larvae tunnel into branches which can lead to ringbarking and death of limbs.								
Indoxacarb (Avatar) FMC	22A	Ingestion	14	P-A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, Inland Katydid, Light Brown Apple Moth, Pear & Cherry Slug, Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Wingless Grasshopper and Garden Weevil.	M Bee:H	R3
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	P-A	ALL	Registered in stone fruit for control of Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Oriental Fruit Moth, Mediterranean Fruit Fly and for suppression of Dried Fruit Beetle.	L-M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Light Brown Apple Moth (*Epiphyas postvittana*) **Oriental Fruit Moth** (*Cydia molesta*) **Priority: Moderate**								
Light Brown Apple Moth is rated as a moderate priority in all states. Oriental Fruit Moth is rated as a moderate priority in VIC and TAS, and as a low priority in NSW and SA. Larvae feed on leaves and the skin of the fruit, which may cause fruit to be unmarketable. Integrated management involving preservation of beneficials and removing weed hosts in and around orchards should be used in conjunction with judicious use of insecticides. Early season control is most effective as larvae can be controlled before they are concealed within the leaves.								
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion	7	A	ALL	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, **Light Brown Apple Moth**, **Oriental Fruit Moth**, San Jose Scale and suppression of Mediterranean Fruit Fly and Queensland Fruit Fly. Apply as part of a broader program involving other products for control of fruit fly, appropriate pest monitoring and farm hygiene. Apply when monitoring indicates fruit fly activity. Apply in rotation with insecticides from a different mode of action using a 7-10 day interval. Do not use consecutive applications and do not use more than 2 applications per season.	M Bee:M	R2
Bacillus thuringiensis subsp Kurstaki Strain HD-1	11	Biological	NR	A	ALL	Registered in fruit for control of Armyworm, Cotton Bollworm, Native Budworm, Cabbage Moth, Cabbage White Butterfly, Loopers, **Light Brown Apple Moth** and Vine Moth. Time spray to coincide with egg hatch. Number of treatments not specified.	VL Bee:VL	-
Chlorantraniliprole (Altacor) FMC	28	Ingestion	14 NG	A	ALL	Registered in stone fruit for control of **Oriental Fruit Moth** and **Light Brown Apple Moth**. Apply a maximum of 2 treatments with a minimum interval of 14 days, commencing at 140 Degree Days after moths are detected in traps.	L Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Cydia pomonella Granulosis Virus V22 (Grandex Biological Insecticide)	-	Biological	NR	A	ALL	Registered in stone fruit for control of Codling Moth and **Oriental Fruit Moth**. Apply as a cover spray when newly hatched larvae are present in the orchard. Apply at 7-14 day intervals while larvae are present. Number of treatments not specified.	VL Bee:VL	-
Dodecadien-1-ol, Dodecanol, Tetradecanol, Dodecenyl Acetate (Isomate)	-	Mating Disruption	NR	A	SA, VIC, NSW, QLD & TAS	Registered in cherries as a mating disruption agent for control of **Oriental Fruit Moth** and Codling Moth. Apply before the first moth emergence in spring. Loop dispensers over spurs and branches within 500 mm of the top of the tree. Us in conjunction with insecticides where moth populations are moderate to high.	VL Bee:VL	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and Leafhopper. Apply as a foliar spray when pests are present. Re-apply as necessary. Number of treatments not specified.	VH Bee:H	-
Indoxacarb (Avatar) FMC	22A	Ingestion	14	A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, Inland Katydid, **Light Brown Apple Moth**, Pear & Cherry Slug, Apple Weevil, Fuller's Rose Weevil, Garden Weevi**l**, Wingless Grasshopper and Garden Weevil. Use not more than 3 applications per crop using a re-treatment interval of 10 days.	M Bee:H	R3
Spinetoram (Delegate) Corteva	5	Ingestion	3 NG	A	ALL	Registered in stone fruit for control of Pear and Cherry Slug, **Light Brown Apple Moth**, **Oriental Fruit Moth** and Western Flower Thrips. Make 3 consecutive applications at either 3-5 day intervals when temperatures are greater than 20°C or 6-12 day intervals when temperatures are less than 20°C. Do not use more than 3 consecutive applications. Do not use more than 4 applications per season.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	A	ALL	Registered in stone fruit (except peaches) for control of Cherry Slug, **Light Brown Apple Moth**, Western Flower Thrips and **Oriental Fruit Moth**. Make 3 consecutive applications at either 3-5 day intervals when temperatures are greater than 20°C or 6-12 day intervals when temperatures are less than 20°C. Do not use more than 3 consecutive applications. Do not use more than 4 applications per season.	L Bee:H	-
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	A	ALL	Registered in stone fruit for control of Apple Weevil (*Otiorhynchus cribricollis*), Fuller's Rose Weevil (*Asynonychus cervinus*), Garden Weevil (*Phlyctinus callosus*), **Oriental Fruit Moth** (*Grapholita molesta*), Mediterranean Fruit Fly (*Ceratitis capitata*) and for suppression of Dried Fruit Beetle (*Carpophilus* spp.) Commence application before beetle populations reach damaging levels and re-treat at 10-14 day intervals. Do not use more than 3 applications per season.	L-M Bee:VH	-
Thiacloprid (Calypso) Bayer	4A	Contact & Ingestion	14 NG	A	ALL	Registered in stone fruit for control of **Oriental Fruit Moth**. Apply in a series of 3 treatments at 14 day intervals commencing at egg hatch of a generational peak as indicated by monitoring. Do not use more than 3 applications per season.	M Bee:L	R2
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, Mites and **Caterpillars**. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Scale Insects (Coccidae) **Priority: Moderate**								
Rated as a moderate priority in NSW and VIC, and as a low priority in TAS and SA. Scale are more prevalent in drier growing regions. Management of Scale should focus on preventing infestations and managing populations before they build up. Strategies include the promotion or introduction of beneficials along with judicious use of insecticides.								
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion	7	A	ALL	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, Light Brown Apple Moth, Oriental Fruit Moth, **San Jose Scale** and suppression of Mediterranean Fruit Fly and Queensland Fruit Fly. Apply from petal fall targeting crawlers when they become active in the canopy. Use up to 2 applications for San Jose Scale control using a minimum re-treatment interval of 14 days.	M Bee:M	R2
Chlorpyrifos (Lorsban)	1B	Contact	14	A	QLD, WA, NSW & ACT	Registered in stone fruit for control of **San Jose Scale.** Dormant period: Apply as a foliar application as late as possible when pests are evident. Seasonal period: Apply to coincide with crawler activity in mid-late November and later if necessary. Number of treatments not specified.	H Bee:H	R1
Diazinon	1B	Contact	14	A	ACT, NSW, SA & WA	Registered in stone fruit for control of **San Jose Scale**. Apply as a cover spray either during dormancy or at budswell and re-treat if pest numbers build up. Number of treatments not specified.	M Bee:VH	R3
Liquid Paraffin (Heavy Paraffinic Dormant Spray Oil)	-	Contact	1	A	VIC, SA, WA, NSW, ACT & QLD	Registered in stone fruit for control of **San Jose Scale**. Spray during dormant season on still sunny days. Do not spray after bud swell. Number of treatments not specified.	L Bee:L	-
Petroleum Oil	-	Contact	1	A	ALL	Registered in stone fruit for control of **San Jose Scale, Oyster Shell Scale**, Bryobia Mite Eggs and European Mite Eggs. Apply during dormant period up to bud swell. Number of treatments not specified.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Spirotetramat (Movento) Bayer	23	Ingestion	21	A	ALL	Registered in stone fruit for control of Tuber Mealybug, Long Tailed Mealybug, Black Cherry Aphid, Black Peach Aphid and **San Jose Scale**. Monitor crops following petal fall. Commence applications at the onset of crawler emergence or when pest numbers reach an economic threshold. To ensure that there is sufficient foliage for product uptake do not apply prior to shuck fall. Use a minimum re-treatment interval of 14 days. Do not use more than 3 applications per crop, with no more than 2 applications made later than 21 days after shuck fall and with a minimum 14 days between applications.	M Bee:L	-
Buprofezin (Applaud) Corteva	16	Ingestion		P		Registered for control of **Scale** in various tree crops including citrus, custard apple, mango, passionfruit and persimmon.	M Bee:L	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022.Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, Green Peach Aphid and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and Green Peach Aphid in green beans, potatoes and sweet potatoes. US registration for control of Aphids and **San Jose Scale** in stone fruit.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Plague Soldier Beetle (*Chauliognathus lugubris*) **Paropsis Beetle** (*Paropsis* spp.) **Red-Shouldered Leaf Beetle** (*Monolepta australis*) **Priority: Low**								
Plague Soldier Beetle is rated as a low priority in all states except VIC, where it is rated as a moderate priority. Paropsis Beetle and Red-Shouldered Leaf Beetle are rated as a low priority in all states.								
Methomyl (Lannate)	1A	Contact	1	A	ALL	Registered in stone fruit for control of Thrips, Green Peach Aphid, Budworm and **Monolepta Beetle**. Apply when pest first appear and repeat depending on infestation. Number of treatments not specified.	H Bee:H	R2
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	7 NG	P-A	ALL	Registered in stone fruit for control of Queensland Fruit Fly, Mediterranean Fruit Fly and Carpophilus Beetle.	M Bee:VH	R2
Indoxacarb (Avatar) FMC	22A	Ingestion	14	P-A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, Inland Katydid, Light Brown Apple Moth, Pear & Cherry Slug, Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Wingless Grasshopper and Garden Weevil.	M Bee:H	R3
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	P-A	ALL	Registered in stone fruit for control of Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Oriental Fruit Moth, Mediterranean Fruit Fly and for suppression of Dried Fruit Beetle.	L-M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Bryobia Mite (*Bryobia praetiosa*) **European Red Mite** (*Panonychus ulmi*) **Peach Silver Mite** (*Aculus fockeui*) **Priority: Low**								
Bryobia Mite and European Red Mite are rated as a low priority in all states except NSW, where they are rated as a moderate priority. Peach Silver Mite is rated as a low priority in all states. Mites damage the tree by causing leaves to turn brown and fall, leading to reduced yield and fruit quality. Management options include reducing dust in the orchard, promotion or introduction of predatory mites and judicious use of miticides while maintaining beneficial populations. Occurrence is seasonal.								
Clofentezine (Apollo) Adama	10A	IGR / Contact	21	A	ALL	Registered in stone fruit for control of Two Spotted Mite**,** **European Red Mite** and **Bryobia Mite**. Apply when the pest is evident but before the population reaches a level where economic damage is imminent. Do not use more than 1 application per season.	L Bee:L	-
Etoxazole (Paramite) Sumitomo	10B	IGR / Contact	7 NG	A	ALL	Registered in stone fruit for control of Two Spotted Mite, **European Red Mite** and **Bryobia Mite**. Apply at the first sign of mite crawlers. Do not use more than 1 application per season.	L Bee:VL	R3
Hexythiazox (Calibre) Nufarm	10A	IGR / Contact	3	A	ALL	Registered in stone fruit for control of Two Spotted Mite and **European Red Mite**. Apply when the pest is evident but before the population reaches a level where economic damage is imminent. Do not use more than 1 application per season.	L Bee:L	-
Liquid Paraffin (Heavy Paraffinic Dormant Spray Oil)	-	Contact	1	A	ALL	Registered in stone fruit for control of **Bryobia Mite** and **European Red Mite**. Spray during dormant season on still sunny days. Do not spray after bud swell. Number of treatments not specified.	L Bee:L	-
Maldison (Fyfanon)	1B	Contact	3	A	NSW, ACT, VIC, TAS, SA & WA	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, **European Red Mite** and Oriental Fruit Moth. Apply at first sign of pest and repeat as necessary. Number of treatments not specified.	H Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Petroleum Oil	-	Contact	1	A	ALL	Registered in stone fruit for control of San Jose Scale, Oyster Shell Scale, **Bryobia Mite Eggs** and **European Mite Eggs**. Apply during dormant period up to bud swell. Number of treatments not specified.	L Bee:L	-
Propargite (Omite)	12C	Contact / Systemic	7	A	QLD & WA	Registered in stone fruit for control of **European Red Mite**. Apply as soon as mites appear. Treatments per season not limited.	M Bee:L	R3
Spiromesifen (Oberon) Bayer	23	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of **Mites** in stone cherries. Not currently registered in AU but under development with Bayer and Hort Innovation for multiple commodities. US registrations for **Mites** in various crops.	M Bee:VL	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, **Mites** and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Bifenazate (Acramite) UPL	20	Contact & Ingestion		P		Registered for control of **European Red Mite** in apples, pears, apricots, nectarines, peaches, plums and control of **Bryobia Mite** in apples, pears, apricots, nectarines, peaches, plums, almonds, fruiting vegetables, cucurbits and trawberries.	L Bee:H	R3
Cyflumetofen (Danisaraba) BASF	25A	Contact		P		Registered for the control of various mite species in pome fruit, citrus, strawberries, grapes, fruiting vegetables, tree nuts and ornamentals. Species controlled are Two Spotted Mite, **European Red Mite**, Citrus Red Mite, Oriental Spider Mite and **Bryobia Mite**.	L Bee:L	-
Fenbutatin Oxide (Torque) BASF	12A	Contact		P		Registered for control of **European Red Mite** and **Bryobia Mite** in apples, pears, peaches and nectarines.	L Bee:L	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Citrophilous Mealybug (*Pseudococcus calciolariae*) **Long-Tailed Mealybug** (*Pseudococcus longispinus*) **Priority: Low**								
Rated as a low priority in all states. Mealybug can cause cosmetic damage to trees and will excrete honeydew which promotes sooty mould outbreaks. Preserving beneficials will assist with management.								
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in fruit trees for control of Aphids, Thrips, **Mealybug**, Two Spotted Mite, Spider Mite and Whitefly. Apply as a cover spray. Number of treatments not specified.	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	21	A	ALL	Registered in stone fruit for control of Tuber Mealybug, **Long Tailed Mealybug**, Black Cherry Aphid, Black Peach Aphid and San Jose Scale. Monitor crops following petal fall. Commence applications at the onset of crawler emergence or when pest numbers reach an economic threshold. To ensure that there is sufficient foliage for product uptake do not apply prior to shuck fall. Apply a second application 14-21 days after the first application if required. Do not use more than 3 applications per crop, with no more than 2 applications made later than 21 days after shuck fall and with a minimum 14 days between applications.	M Bee:L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	P-A	ALL	Registered in stone fruit for control of Apple Dimpling Bug, Cherry Aphid, Green Peach Aphid and Black Peach Aphid. Registered for control of Mealybug in cotton, citrus, grapes, pome fruit and nursery stock.	M Bee:VH	-
Buprofezin (Applaud) Corteva	16	Ingestion		P		Registered for control of **Mealybug** in citrus, custard apple, grapes, passionfruit, pears, persimmons and tomatoes.	M Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022.Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, Green Peach Aphid and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and Green Peach Aphid in green beans, potatoes and sweet potatoes. US registration for control of Aphids and San Jose Scale in stone fruit.	L Bee:L	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in stone fruit.First global application is proposed for 2023 for Thrips, Bugs, Mites and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Apple Dimpling Bug (*Campylomma liebknechti*) **Rutherglen Bug** (*Nysius vinitor*) **Priority: Low**								
Rated as a low priority in all states. Apple Dimpling Bug and Rutherglen Bug can attack orchards in large numbers in favourable seasons. They breed up on weeds in surrounding areas, so orchards should be kept weed free to reduce infestations. The ripening fruit is susceptible to damage caused by piercing and feeding on the flesh.								
Pyrethrin (Pyganic) Sumitomo	3A	Contact	NR	A	ALL	Registered in stone fruit for control of Fruit Fly, **Rutherglen Bug** and Spiders. Use as a clean-up spray ton remove insects just prior to harvest. Apply a maximum of 3 sprays at 3 day intervals.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in stone fruit for control of **Apple Dimpling Bug**, Cherry Aphid, Green Peach Aphid and Black Peach Aphid. Apply when the pest reaches threshold levels. Do not use consecutive applications and do not exceed 2 applications per season.	M Bee:VH	-
Trichlorfon (Lepidex)	1B	Contact	2	A	NSW, VIC, TAS, SA & WA	Registered in stone fruit for control of **Rutherglen Bug**. Apply when pest outbreak occurs and repeat if re-invaded. Number of treatments not specified.	H Bee:H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022. Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, Green Peach Aphid and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and Green Peach Aphid in green beans, potatoes and sweet potatoes. US registration for control of Aphids and San Jose Scale in stone fruit.	L Bee:L	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, Mites and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Katydid (*Caedicia* spp.) **Priority: Low**								
Rated as a low priority in all states. Katydids will mostly feed on foliage and control is rarely warranted.								
Indoxacarb (Avatar) FMC	22A	Ingestion	14	A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, **Inland Katydid**, Light Brown Apple Moth, Pear & Cherry Slug, Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Wingless Grasshopper and Garden Weevil. Use not more than 3 applications per crop using a re-treatment interval of 10 days.	M Bee:H	R3
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022.Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, Green Peach Aphid and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and Green Peach Aphid in green beans, potatoes and sweet potatoes. US registration for control of **Katydid** nymphs in citrus.	L Bee:L	-
Green Treehopper (*Sextius virescens*) **Jassids / Leafhoppers** (*Cicadellidae* spp.) **Priority: Low**								
Rated as a low priority in all states. Treehoppers and Leafhoppers will mostly feed on foliage and control is rarely warranted.								
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and **Leafhopper**. Apply as a foliar spray when pests are present. Re-apply as necessary. Number of treatments not specified.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	P-A	ALL	Registered in stone fruit for control of Apple Dimpling Bug, Cherry Aphid, Green Peach Aphid and Black Peach Aphid. US registration for control of **Leafhoppers** in berries, pome fruit and root and tuber vegetables.	M Bee:VH	-
Buprofezin (Applaud) Corteva	16	Ingestion		P		Registered for control of **Leafhoppers** in citrus.	M Bee:L	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant to undertake studies to support a label registration in stone fruit for the control of fruit fly. Project ST21001 to commence in June 2022.Registered in macadamias for control of Fruit Spotting Bugs, Macadamia Lace Bug and suppression of Scirtothrips, control of Fruit Spotting Bugs and Planthoppers in avocados, mangoes and papaya, control of Whitefly, Green Peach Aphid and Cotton Aphid in cucurbits and fruiting vegetables, and control of Silverleaf Whitefly and Green Peach Aphid in green beans, potatoes and sweet potatoes. US registration for control of **Leafhoppers** in brassica vegetables.	L Bee:L	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, Mites and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Cotton Bollworm (*Helicoverpa armigera*) **Native Budworm** (*Helicoverpa punctigera*) **Codling Moth** (*Cydia pomonella*) **Orange Fruit Borer** (*Isotenes miserana*) **Painted Apple Moth** (*Teia anartoides*) **Tortricid Moth** (*Epiphyas xylodes*) **Priority: Low**								
Rated as low priorities in all states. Most of these caterpillars will cause minor leaf damage only. Codling Moth will also feed on fruit, but it is rarely seen in cherries.								
Bacillus thuringiensis subsp Kurstaki Strain HD-1	11	Biological	NR	A	ALL	Registered in fruit for control of Armyworm, **Cotton Bollworm**, **Native Budworm**, Cabbage Moth, Cabbage White Butterfly, Loopers, Light Brown Apple Moth and Vine Moth. Time spray to coincide with egg hatch. Number of treatments not specified.	VL Bee:VL	-
Cydia pomonella Granulosis Virus V22 (Grandex Biological Insecticide)	-	Biological	NR	A	ALL	Registered in stone fruit for control of **Codling Moth** and Oriental Fruit Moth. Apply as a cover spray when newly hatched larvae are present in the orchard. Apply at 7-14 day intervals while larvae are present. Number of treatments not specified.	VL Bee:VL	-
Dodecadien-1-ol, Dodecanol, Tetradecanol, Dodecenyl Acetate (Isomate)	-	Mating Disruption	NR	A	SA, VIC, NSW, QLD & TAS	Registered in cherries as a mating disruption agent for control of Oriental Fruit Moth and **Codling Moth**. Apply before the first moth emergence in spring. Loop dispensers over spurs and branches within 500 mm of the top of the tree. Us in conjunction with insecticides where moth populations are moderate to high.	VL Bee:VL	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, Aphids, Caterpillars, Earwigs, Whitefly, Thrips and Leafhopper. Apply as a foliar spray when pests are present. Re-apply as necessary. Number of treatments not specified.	VH Bee:H	-
Methomyl (Lannate)	1A	Contact	1	A	ALL	Registered in stone fruit for control of Thrips, Green Peach Aphid, **Budworm** and Monolepta Beetle. Apply at petal fall. Number of treatments not specified.	H Bee:H	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion	7	P-A	ALL	Registered in stone fruit for control of Black Peach Aphid, Green Peach Aphid, Light Brown Apple Moth, Oriental Fruit Moth, San Jose Scale and suppression of Mediterranean Fruit Fly and Queensland Fruit Fly. Registered for control of **Codling Moth** in pome fruit.	M Bee:M	R2
Chlorantraniliprole (Altacor) FMC	28	Ingestion	14 NG	P-A	ALL	Registered in stone fruit for control of Oriental Fruit Moth and Light Brown Apple Moth. Registered for control of **Codling Moth** and ***Helicoverpa* spp.** in pome fruit.	L Bee:VL	-
Indoxacarb (Avatar) FMC	22A	Ingestion	14	P-A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, Inland Katydid, Light Brown Apple Moth, Pear & Cherry Slug, Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Wingless Grasshopper and Garden Weevil. Registered for control of **Codling Moth** in pome fruit, and control of ***Helicoverpa* spp.** in pome fruit, brassica vegetables, celery, brassica leafy vegetables, leafy vegetables, cucurbits, fruiting vegetables and sweet corn.	M Bee:H	R3
Spinetoram (Delegate) Corteva	5	Ingestion	3 NG	P-A	ALL	Registered in stone fruit for control of Pear and Cherry Slug, Light Brown Apple Moth, Oriental Fruit Moth and Western Flower Thrips. Registered for control of ***Helicoverpa* spp.** in pome fruit and citrus, and control of **Codling Moth** in pome fruit.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Ingestion	3 G:14	P-A	ALL	Registered in stone fruit (except peaches) for control of Cherry Slug, Light Brown Apple Moth, Western Flower Thrips and Oriental Fruit Moth. Registered for control of ***Helicoverpa* spp.** in brassica vegetables, cucurbits, herbs, fruiting vegetables, leafy vegetables, legume vegetables, root and tuber vegetables, stalk and stem vegetables, sweet corn, berryfruit, citrus and pome fruit.	L Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Tetraniliprole (Vayego) Bayer	28	Ingestion	3 NG	P-A	ALL	Registered in stone fruit for control of Apple Weevil, Fuller's Rose Weevil, Garden Weevil, Oriental Fruit Moth, Mediterranean Fruit Fly and for suppression of Dried Fruit Beetle. Registered for control of **Codling Moth** in pome fruit.	L-M Bee:VH	-
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms, and a foliar treatment for the control of chewing pests in various crops.	-	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, Mites and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Methoxyfenozide (Prodigy) Corteva	18	Ingestion		P		Permitted for control of Fall Armyworm in nursery stock.	VL Bee:VL	-
Fall Armyworm (*Spodoptera frugiperda*) **Priority: Low**								
Rated as a low priority in all states. Fall Armyworm is an exotic pest that can reproduce prolifically, especially in warm weather. It is important to monitor crops for eggs and larvae of pest species by regular field scouting. Target sprays against mature eggs and newly hatched larvae before pests become entrenched.								
Chlorantraniliprole (Altacor) FMC PER89259	28	Ingestion	14 NG	A	ALL (excl. VIC)	Permitted in stone fruit for control of **Fall Armyworm**. Treat when pests appear, targeting eggs at hatch or small larvae (prior to third instar stage) before the pest becomes entrenched. Do not use more than 2 applications per season with a minimum 14 days between applications.	L Bee:VL	-
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Contact	1	A	ALL	Registered in fruit trees for control of Ants, Aphids, **Caterpillars**, Earwigs, Whitefly, Thrips and Leafhopper. Apply as a foliar spray when pests are present. Re-apply as necessary. Number of treatments not specified.	VH Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Indoxacarb (Avatar) FMC PER89278	22A	Ingestion	14	A	ALL (excl. VIC)	Permitted in cherries for control of **Fall Armyworm**. Do not use more than 2 applications per crop with a minimum 10 day re-treatment interval.	M Bee:H	R3
Methomyl (Lannate) PER89293	1A	Contact	1	A	ALL	Permitted in stone fruit for control of **Fall Armyworm**. Apply as a foliar spray. Target sprays against eggs and newly hatched larvae (prior to third instar stage) before they become entrenched. Treatments per season not limited.	H Bee:H	R2
Spinetoram (Delegate) Corteva PER89241	5	Ingestion	3 NG	A	ALL (excl. VIC)	Permitted in stone fruit for control of **Fall Armyworm**. Treat when pests appear, targeting eggs at hatch or small larvae (prior to third instar stage) before the pest becomes entrenched. Do not exceed 4 applications per season with a 14 day retreatment interval	M Bee:VH	-
Spinosad (Entrust Organic) Corteva PER89870	5	Ingestion	3 G:14	A	ALL (excl. VIC)	Permitted in stone fruit (except peaches) for control of **Fall Armyworm**. Treat when pests appear, targeting eggs at hatch or small larvae (prior to third instar stage) before the pest becomes entrenched. Do not exceed 4 applications per season with a 7-14 day retreatment interval.	L Bee:H	-
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Pending registration as an ant bait. It also has potential uses as a seed treatment for the control of Wireworms, and a foliar treatment for the control of chewing pests in various crops.	-	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Hort Innovation project ST20003 is generating data to support a label registration for control of Thrips in cherries. First global application is proposed for 2023 for Thrips, Bugs, Mites and Caterpillars. Registration submitted May 2021 for Simodis to control Mites, Thrips and Helicoverpa in fruiting vegetables.	-	-
Methoxyfenozide (Prodigy) Corteva	18	Ingestion		P		Permitted for control of Fall Armyworm in nursery stock.	VL Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Snails (*Gastropoda* spp.) **Priority: Low**								
Rated as a high priority in TAS, a moderate priority in SA, and as a low priority in NSW and VIC. Snails will feed on the fruit, reducing yield and quality. Baiting should be used in conjunction with removal of ground shelter (weeds, plant litter) for snails.								
Iron EDTA Complex	-	Contact & Ingestion	NR	A	ALL	Registered in all plants for the control of **Snails** & **Slugs**. Spread pellets evenly on ground. Number of treatments not specified.	-	-
Methiocarb (Mesurol) Bayer	1A	Contact	7 G:28	A	ALL	Registered in stone fruit for control of Slugs and **Snails**. Scatter baits evenly onto ground where snails or slugs occur. Keep away from domestic pets.	H Bee:H	-
Metaldehyde	-	Contact & Ingestion		P		Registered for control of Slugs and **Snails** in vegetables.	-	-
Wingless Grasshopper (*Phaulacridium vittatum*) **Priority: Low**								
Rated as a low priority in all states except NSW, where it is rated as a moderate priority. Will generally only cause minor leaf damage to trees.								
Fenitrothion	1B	Contact	14 G:14	A	NSW, VIC, SA & WA	Registered in cherries for control of Spur-Throated Locust, Migratory Locust and **Wingless Grasshopper**. Minimum re-treatment interval 14 days. Number of treatments not specified.	H Bee:H	-
Indoxacarb (Avatar) FMC	22A	Ingestion	14	A	ALL	Registered in cherries for suppression of European Earwig, and for control of Oriental Fruit Moth, Inland Katydid, Light Brown Apple Moth, Pear & Cherry Slug, Apple Weevil, Fuller's Rose Weevil, Garden Weevil, **Wingless Grasshopper** and Garden Weevil. Use not more than 3 applications per crop using a re-treatment interval of 10 days.	M Bee:H	R3

4.3 Weeds in cherries

4.3.1 Weed priorities

Common Name	Scientific Name
High	
Marshmallow	*Malva parviflora*
Wireweed	*Polygonum* spp.
Moderate	
English Couch	*Elymus repens*
Willow Herb	*Epilobium* spp.
Fat Hen	*Chenopodium album*
Couch Grass	*Cynodon dactylon*
Low	
Hairy Bittercress	*Cardamine hirsuta*
Flaxleaf Fleabane	*Conyza bonariensis*
Amsinckia	*Amsinckia* spp.
Canada / Californian Thistle	*Cirsium arvense*
Clover	*Trifolium* spp.
Native Cucurbit	*Cucumis* spp.
Nipple Wart / Wort	*Lapsana communis*
Blackberry Nightshade	*Solanum nigrum*
Silverleaf Nightshade	*Solanum elaeagnifolium*
Feather Top Rhodes Grass	*Chloris virgata*
Annual Ryegrass	*Lolium rigidum*
Brome Grass	*Bromus diandrus, B. rigidus*

The high priority weeds identified were Marshmallow and Wireweed. An integrated weed management program incorporating mulch and inter-row grass cover should be used to reduce reliance on herbicides in orchards.

Resistance management
There are confirmed cases of resistance in Australia for Awnless Barnyard Grass (Group 9 at more than 200 sites), Feather Top Rhodes Grass (Group 9 at 4 sites) and Blackberry Nightshade (Group 22 at 2 sites).

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

[6] 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 7)	
		R1	Short-term: Critical concern over retaining access
**	Moderate resistance risk	R2	Medium-term: Maintaining access of significant concern
***	High resistance risk	R3	Long-term: Potential issues associated with use - Monitoring required

Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Marshmallow (*Malva parviflora*) **Priority: High**							
Rated as a high priority in TAS and SA, and as a moderate priority in NSW and VIC. Adapted to a wide variety of environments and highly competitive weed. Control with knockdown herbicides can be unreliable.							
Carfentrazone (Hammer)	14**	Stone Fruit / Directed Spray	Registered in stone fruit for control of various broadleaf weeds, including **Marshmallow**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR G:14	A	ALL	-
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Flumioxazin (Chateau) Sumitomo	14**	Stone Fruit / Directed Spray / Residual Weed Control	Registered in stone fruit as a directed spray for residual control of grass and broadleaf weeds, including **Marshmallow**.	98 G:28	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Marshmallow**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Bearing and Non-Bearing Fruit Tree / Residual Weed Control	Registered in non-bearing fruit trees for control of broadleaf weeds, including **Marshmallow**. Apply as a directed spray to weed-free, well-prepared soil. Must be activated by at least 12.5mm of rainfall or sprinkler irrigation within 21 days of application.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in stone fruit for control of various grass and broadleaf weeds, including **Marshmallow**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds, including **Marshmallow**. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds, including **Marshmallow**. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds, including **Marshmallow**. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Wireweed (*Polygonum* spp.) **Priority: High**							
Rated as a high priority in NSW and TAS, and as a moderate priority in VIC and SA. Grows rapidly in the warmer months and is difficult to control with herbicides. Application timing is critical to ensure small weeds are targeted.							
Glufosinate (Basta)	10**	Stone Fruit / Directed or Shielded Spray	Registered in stone fruit for control of grass and broadleaf weeds, including **Wireweed**. Apply treatment along the sides of crops and between rows of crops.	21 G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Bearing and Non-Bearing Fruit Tree / Residual Weed Control	Registered in non-bearing fruit trees for control of broadleaf weeds, including **Wireweed**. Apply as a directed spray to weed-free, well-prepared soil. Must be activated by at least 12.5mm of rainfall or sprinkler irrigation within 21 days of application.	NR	A	ALL	-
Norflurazon (Zoliar) AgNova	12**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds, including **Wireweed**. Apply to bare soil prior to weed emergence. Avoid contact with foliage or fruit. Rainfall or irrigation within 2-3 weeks of application is necessary for activation.	NR	A	ALL	-
Oryzalin	3**	Stone Fruit / Non-Bearing Fruit / Directed Spray	Registered in stone fruit for control of various grass and broadleaf weeds, including **Wireweed**. Apply as a directed spray.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in stone fruit for control of various grass and broadleaf weeds, including **Wireweed**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds, including **Wireweed**. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds, including **Wireweed**. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds, including **Wireweed**. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Pendimethalin (Stomp)	3**	Deciduous Fruits / Directed Spray / Residual Weed Control	Registered in deciduous fruits for control of various grass and broadleaf weeds, including **Wireweed**. Do not allow spray to contact any part of the tree, including the trunk. Incorporate with at least 5mm of rainfall or spray irrigation as soon as possible but no later than 10 days after treatment.	NR	A	ALL	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including suppression of **Wireweed** in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
English Couch (*Elymus repens*) **Priority: Moderate**							
Rated as a high priority in TAS, a moderate priority in NSW and SA, and as a low priority in VIC. English Couch is an erect, perennial grass which spreads readily by numerous underground rhizomes. Herbicide control is difficult and multiple applications are required in conjunction with good hygiene to avoid spreading outbreaks around the orchard.							
2,2-DPA	0**	Cherries / Residual Weed Control	Registered in cherries for control of annual and perennial grasses. Apply as a directed application. Apply to established trees only.	7	A	ALL	-
Amitrole	34**	Orchards / Directed Spray	Registered in orchards as a directed spray for the control of grass and broadleaf weeds.	56	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Clethodim (Select)	1***	Non-Bearing Fruit Trees	Registered in non-bearing fruit trees for control of annual and perennial grass weeds. Apply after trees have recovered from transplant shock and are showing signs of active growth. Do not apply to bearing trees.	NR	A	ALL	-
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Fluazifop-P (Fusilade)	1***	Stone Fruit / Directed Spray or Shielded Spray	Registered in stone fruit for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Flumioxazin (Chateau) Sumitomo	14**	Stone Fruit / Directed Spray / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds. Apply as a directed spray.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Stone Fruit / Directed or Shielded Spray	Registered in stone fruit for control of grass and broadleaf weeds. Apply treatment along the sides of crops and between rows of crops.	21 G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Stone Fruit / Directed Spray or Spot Spray	Registered in stone fruit for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Napropamide (Devrinol)	0**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds. Apply to weed-free soil of fine tilth. Apply as a directed spray avoiding contact with fruit or foliage. Incorporate with moisture or cultivation within 10 days of treatment.	NR NG	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Norflurazon (Zoliar) AgNova	12**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds. Apply to bare soil prior to weed emergence. Avoid contact with foliage or fruit. Rainfall or irrigation within 2-3 weeks of application is necessary for activation.	NR	A	ALL	-
Oryzalin	3**	Stone Fruit / Non-Bearing Fruit / Directed Spray	Registered in stone fruit for control of various grass and broadleaf weeds. Apply as a directed spray.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in stone fruit for control of various grass and broadleaf weeds. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Pendimethalin (Stomp)	3**	Deciduous Fruits / Directed Spray / Residual Weed Control	Registered in deciduous fruits for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk. Incorporate with at least 5mm of rainfall or spray irrigation as soon as possible but no later than 10 days after treatment.	NR	A	ALL	-
Trifluralin	3**	Orchards / Pre-Plant Residual	Registered in orchards as a pre-plant residual for control of grass and broadleaf weeds.	NR	A	QLD, SA, WA, VIC & TAS	-

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		-
Willow Herb (*Epilobium* spp.) **Priority: Moderate**							
Rated as a high priority in TAS, a moderate priority in NSW, and as a low priority in VIC and SA. A widespread, perennial broadleaf weed which requires a program of integrated weed control measures to manage.							
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Willow Herb**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Fat Hen (*Chenopodium album*) **Priority: Moderate**							
Rated as a high priority in NSW, a moderate priority in TAS, and as a low priority in VIC and SA. Fat Hen is a fast-growing woody annual weed, which can germinate throughout most of the year. Timely herbicide control id critical for managing this weed.							
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Flumioxazin (Chateau)	14**	Pome Fruit / Directed Spray / Residual Control	Registered in pome fruit as a directed spray for residual control of grass and broadleaf weeds, including **Fat Hen**.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Fat Hen**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Fat Hen**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Bearing & Non-Bearing Fruit Trees / Residual Weed Control	Registered in non-bearing fruit trees for control of broadleaf weeds, including **Fat Hen**. Apply as a directed spray to weed-free, well prepared soil. Must be activated by at least 12.5mm of rainfall or sprinkler irrigation within 21 days of application.	NR	A	ALL	-
Norflurazon (Zoliar) AgNova	12**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds, including **Fat Hen**. Apply to bare soil prior to weed emergence. Avoid contact with foliage or fruit. Rainfall or irrigation within 2-3 weeks of application is necessary for activation.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in stone fruit for control of various grass and broadleaf weeds, including **Fat Hen**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Oryzalin	3**	Stone Fruit / Non-Bearing Fruit / Directed Spray	Registered in stone fruit for control of various grass and broadleaf weeds, including **Fat Hen**. Apply as a directed spray.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds, including **Fat Hen**. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds, including **Fat Hen**. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds, including **Fat Hen**. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including **Fat Hen** in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Couch Grass (*Cynodon dactylon*) **Priority: Moderate**							
Rated as a moderate priority in NSW, VIC and SA, and as a low priority in TAS. Couch Grass is an aggressive and highly competitive perennial grass that grows year-round in most areas. Herbicide control is effectively provided it is targeted to young, actively growing weeds. Multiple applications are usually required.							
Fluazifop-P (Fusilade)	1***	Stone Fruit / Directed Spray or Shielded Spray	Registered in stone fruit for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Couch Grass**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Couch Grass**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Stone Fruit / Directed Spray or Spot Spray	Registered in stone fruit for control of grass weeds, including **Couch Grass**. Apply as a directed spray.	NR	A	ALL	-
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		-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Hairy Bittercress (*Cardamine hirsuta*) **Priority: Low**							
Rated as a moderate priority in TAS, and as a low priority in NSW, VIC and SA. Hairy Bittercress is a low-growing annual broadleaf weed. It has a long, deep taproot which makes control difficult. Chemical and mechanical control measures are effective provided that they used early.							
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Flaxleaf Fleabane (*Conyza bonariensis*) **Priority: Low**							
Rated as a moderate priority in NSW, and as a low priority in VIC, TAS and SA. Flaxleaf Fleabane seeds prolifically and can germinate year-round. It is difficult to control with herbicides and a continuous program is required to manage it in the orchard.							
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Flumioxazin (Chateau)	14**	Pome Fruit / Directed Spray / Residual Control	Registered in pome fruit as a directed spray for residual control of grass and broadleaf weeds, including **Flaxleaf Fleabane**.	98 G:28	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Flaxleaf Fleabane**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds, including **Flaxleaf Fleabane**. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds, including **Flaxleaf Fleabane**. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds, including **Flaxleaf Fleabane**. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Amsinckia (*Amsinckia* spp.) **Priority: Low**							
Rated as a low priority in all states. Amsinkia is an annual broadleaf weed which is highly competitive with other vegetation. Chemical and mechanical control measures are effective provided that they used early.							
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in stone fruit for control of various grass and broadleaf weeds, including **Amsinkia**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Canada / Californian Thistle (*Cirsium arvense*) **Priority: Low**							
Rated as a low priority in all states except TAS, where it is rated as a high priority. A perennial broadleaf weed that is high competitive and difficult to control with knockdown and residual herbicides.							
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Clover (*Trifolium* spp.) **Priority: Low**							
Rated as a low priority in all states. An annual broadleaf weed that can be readily controlled if weeds are sprayed when they are young and actively growing.							
Carfentrazone (Hammer)	14**	Stone Fruit / Directed Spray	Registered in stone fruit for control of various broadleaf weeds, including **Clover**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR G:14	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Clover**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Bearing and Non-Bearing Fruit Tree / Residual Weed Control	Registered in non-bearing fruit trees for control of broadleaf weeds, including **Clover**. Apply as a directed spray to weed-free, well-prepared soil. Must be activated by at least 12.5mm of rainfall or sprinkler irrigation within 21 days of application.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Native Cucurbit (*Cucumis* spp.) **Priority: Low**							
Rated as a low priority in all states. An annual broadleaf weed that can be readily controlled if weeds are sprayed when they are young and actively growing.							
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Pendimethalin (Stomp)	3**	Deciduous Fruits / Directed Spray / Residual Weed Control	Registered in deciduous fruits for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk. Incorporate with at least 5mm of rainfall or spray irrigation as soon as possible but no later than 10 days after treatment.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Nipple Wart / Wort (*Lapsana communis*) **Priority: Low**							
Rated as a low priority in all states. An annual broadleaf weed that can be readily controlled if weeds are sprayed when they are young and actively growing.							
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Blackberry Nightshade (*Solanum nigrum*) **Priority: Low**							
Rated as a low priority in all states except TAS, where it is rated as a moderate priority. Prolific weed that is widely adapted and difficult to eradicate, mainly due to its long-term seed viability.							
Amitrole	34**	Orchards / Directed Spray	Registered in orchards as a directed spray for the control of grass and broadleaf weeds, including **Blackberry Nightshade**.	56	A	ALL	-
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Flumioxazin (Chateau)	14**	Pome Fruit / Directed Spray / Residual Control	Registered in pome fruit as a directed spray for residual control of grass and broadleaf weeds, including **Blackberry Nightshade**.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Blackberry Nightshade**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Blackberry Nightshade**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Bearing & Non-Bearing Fruit Trees / Residual Weed Control	Registered in non-bearing fruit trees for control of broadleaf weeds, including **Blackberry Nightshade**. Apply as a directed spray to weed-free, well prepared soil. Must be activated by at least 12.5mm of rainfall or sprinkler irrigation within 21 days of application.	NR	A	ALL	-
Norflurazon (Zoliar) AgNova	12**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds, including **Blackberry Nightshade**. Apply to bare soil prior to weed emergence. Avoid contact with foliage or fruit. Rainfall or irrigation within 2-3 weeks of application is necessary for activation.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in stone fruit for control of various grass and broadleaf weeds, including **Blackberry Nightshade**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Oryzalin	3**	Stone Fruit / Non-Bearing Fruit / Directed Spray	Registered in stone fruit for control of various grass and broadleaf weeds, including **Blackberry Nightshade**. Apply as a directed spray.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds, including **Blackberry Nightshade**. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds, including **Blackberry Nightshade**. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds, including **Blackberry Nightshade**. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Pendimethalin (Stomp)	3**	Deciduous Fruits / Directed Spray / Residual Weed Control	Registered in deciduous fruits for control of various grass and broadleaf weeds, including **Blackberry Nightshade**. Do not allow spray to contact any part of the tree, including the trunk. Incorporate with at least 5mm of rainfall or spray irrigation as soon as possible but no later than 10 days after treatment.	NR	A	ALL	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including **Blackberry Nightshade** in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Silverleaf Nightshade (*Solanum elaeagnifolium*) **Priority: Low**							
Rated as a low priority in all states. Prolific weed that is widely adapted and difficult to eradicate, mainly due to its long-term seed viability.							
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Silverleaf Nightshade**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Oryzalin	3**	Stone Fruit / Non-Bearing Fruit / Directed Spray	Registered in stone fruit for control of various grass and broadleaf weeds, including **Silverleaf Nightshade**. Apply as a directed spray.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Pendimethalin (Stomp)	3**	Deciduous Fruits / Directed Spray / Residual Weed Control	Registered in deciduous fruits for control of various grass and broadleaf weeds, including **Silverleaf Nightshade**. Do not allow spray to contact any part of the tree, including the trunk. Incorporate with at least 5mm of rainfall or spray irrigation as soon as possible but no later than 10 days after treatment.	NR	A	ALL	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including **Silverleaf Nightshade** in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Feather Top Rhodes Grass (*Chloris virgata*) **Priority: Low**							
Rated as a moderate priority in all states. Feathertop Rhodes Grass is an aggressive grass weed that is difficult to control with herbicides. Multiple applications are required.							
Clethodim (Select)	1***	Non-Bearing Fruit Trees	Registered in non-bearing fruit trees for control of annual and perennial grass weeds, including **Feather Top Rhodes Grass**. Apply after trees have recovered from transplant shock and are showing signs of active growth. Do not apply to bearing trees.	NR	A	ALL	R3
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Fluazifop-P (Fusilade)	1***	Stone Fruit / Directed Spray	Registered in stone fruit as a directed spray for the control of grass weeds, including **Feather Top Rhodes Grass**.	14	A	QLD, NSW, WA & NT	-
Flumioxazin (Chateau)	14**	Pome Fruit / Directed Spray / Residual Control	Registered in pome fruit as a directed spray for residual control of grass and broadleaf weeds, including **Feather Top Rhodes Grass**.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Feather Top Rhodes Grass**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Feather Top Rhodes Grass**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Stone Fruit / Directed Spray or Spot Spray	Registered in stone fruit for control of grass weeds, including **Feather Top Rhodes Grass**. Apply as a directed spray.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds, including **Feather Top Rhodes Grass**. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds, including **Feather Top Rhodes Grass**. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds, including **Feather Top Rhodes Grass**. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
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		-
Annual Ryegrass (*Lolium rigidum*) **Priority: Low**							
Rated as a moderate priority in NSW and SA, and as a low priority in VIC and TAS. 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.							
Amitrole	34**	Orchards / Directed Spray	Registered in orchards as a directed spray for the control of grass and broadleaf weeds, including **Ryegrass**.	56	A	ALL	-
Clethodim (Select)	1***	Non-Bearing Fruit Trees	Registered in non-bearing fruit trees for control of annual and perennial grass weeds, including **Ryegrass**. Apply after trees have recovered from transplant shock and are showing signs of active growth. Do not apply to bearing trees.	NR	A	ALL	R3
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Fluazifop-P (Fusilade)	1***	Stone Fruit / Directed Spray	Registered in stone fruit as a directed spray for the control of grass weeds, including **Ryegrass**.	14	A	QLD, NSW, WA & NT	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Flumioxazin (Chateau)	14**	Pome Fruit / Directed Spray / Residual Control	Registered in pome fruit as a directed spray for residual control of grass and broadleaf weeds, including **Ryegrass**.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Ryegrass**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Annual Ryegrass**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Stone Fruit / Directed Spray or Spot Spray	Registered in stone fruit for control of grass weeds, including **Annual Ryegrass**. Apply as a directed spray.	NR	A	ALL	-
Napropamide (Devrinol)	0**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds, including **Ryegrass**. Apply to weed-free soil of fine tilth. Apply as a directed spray avoiding contact with fruit or foliage. Incorporate with moisture or cultivation within 10 days of treatment.	NR NG	A	ALL	-
Norflurazon (Zoliar) AgNova	12**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds, including **Ryegrass**. Apply to bare soil prior to weed emergence. Avoid contact with foliage or fruit. Rainfall or irrigation within 2-3 weeks of application is necessary for activation.	NR	A	ALL	-
Oryzalin	3**	Stone Fruit / Non-Bearing Fruit / Directed Spray	Registered in stone fruit for control of various grass and broadleaf weeds, including **Annual Ryegrass**. Apply as a directed spray.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in stone fruit for control of various grass and broadleaf weeds, including **Annual Ryegrass**. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds, including **Ryegrass**. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds, including **Ryegrass**. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds, including **Ryegrass**. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Pendimethalin (Stomp)	3**	Deciduous Fruits / Directed Spray / Residual Weed Control	Registered in deciduous fruits for control of various grass and broadleaf weeds, including **Annual Ryegrass**. Do not allow spray to contact any part of the tree, including the trunk. Incorporate with at least 5mm of rainfall or spray irrigation as soon as possible but no later than 10 days after treatment.	NR	A	ALL	-
Trifluralin	3**	Orchards / Pre-Plant Residual	Registered in orchards as a pre-plant residual for control of grass and broadleaf weeds, including **Ryegrass**.	NR	A	QLD, SA, WA, VIC & TAS	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including **Annual Ryegrass** in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
S-Metolachlor+ Prosulfocarb (Boxer Gold) Syngenta	15**		Registered for control of Ryegrass in potatoes.		P		-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Brome Grass (*Bromus diandrus*, *B. rigidus*) **Priority: Low**							
Rated as a low priority in all states except TAS, where it is rated as a moderate priority. Highly competitive annual grass weed, which is relatively easy to control with good orchard weed management strategies.							
Clethodim (Select)	1***	Non-Bearing Fruit Trees	Registered in non-bearing fruit trees for control of annual and perennial grass weeds, including **Ryegrass**. Apply after trees have recovered from transplant shock and are showing signs of active growth. Do not apply to bearing trees.	NR	A	ALL	R3
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Registered in orchards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	-
Fluazifop-P (Fusilade)	1***	Stone Fruit / Directed Spray or Shielded Spray	Registered in stone fruit for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Glufosinate (Basta)	10**	Non-Bearing Fruit Trees / Directed or Shielded Spray	Registered in non-bearing fruit trees for control of various grass and broadleaf weeds, including **Brome Grass**. Apply treatment along the sides of crops and between rows of crops.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Registered in stone fruit for control of various grass and broadleaf weeds, including **Brome Grass**. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Stone Fruit / Directed Spray or Spot Spray	Registered in stone fruit for control of grass weeds, including **Brome Grass**. Apply as a directed spray.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Norflurazon (Zoliar) AgNova	12**	Stone Fruit / Residual Weed Control	Registered in stone fruit for control of various grass and broadleaf weeds, including **Brome Grass**. Apply to bare soil prior to weed emergence. Avoid contact with foliage or fruit. Rainfall or irrigation within 2-3 weeks of application is necessary for activation.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Registered in orchards for control of annual weeds. Avoid contact with crop foliage.	H:NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	G:1	A	ALL	R3
Trifluralin	3**	Orchards / Pre-Plant Residual	Registered in orchards as a pre-plant residual for control of grass and broadleaf weeds, including **Brome Grass**.	NR	A	QLD, SA, WA, VIC & TAS	-
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		-

4.4 Plant Growth Regulators in cherries

4.4.1 Plant Growth Regulator priorities

PGR Issue
High
Control of Vegetative Growth
Advancement of Maturity
Increase Fruit Size
Moderate
Extend Shelf Life / Improve Fruit Quality
Fruit Thinning

4.3.2 Available and potential plant growth regulators

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		
Regulatory risk (refer to Appendix 7)			
R1	Short-term: Critical concern over retaining access		
R2	Medium-term: Maintaining access of significant concern		
R3	Long-term: Potential issues associated with use - Monitoring required		
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	WHP (days)	Availability	States	Regulatory Risk
Control of Vegetative Growth **Priority: High**							
Rated as a high priority in NSW and TAS, as a moderate priority in VIC and SA.							
Gibberellins + 6-Benzyladenine (Cytolin)	PGR	Cherries	Registered in cherries for stimulation of lateral growth on non-bearing trees. Apply between bud swell and budburst. Apply to trees just after planting or in young non-bearing trees in the following year – still at least 1 year before trees start to bear fruit.	NR	A	ALL	-
Paclobutrazol	PGR	Cherries / Trickle Irrigation or Collar Drench	Registered in cherries to reduce vegetative growth. Apply in early autumn or in spring between 14 days prior to budburst and full bloom. Bloom dates may be advanced. Do not re-treat until the season in which normal growth resumes.	NR	A	ALL	-
Prohexadione-Calcium (Regalis)	PGR	Cherries	Registered in cherries for reduction of shoot growth. Apply in a program of 2 sprays 3-4 weeks apart commencing when terminal shoots are 5cm in length.	28 G:56	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use	WHP (days)	Availability	States	Regulatory Risk
Advancement of Maturity **Priority: High**							
Rated as a high priority in NSW, VIC and TAS, and as a moderate priority in SA.							
Ethephon	PGR	Cherries	Registered in cherries to promote evenness of maturity and early colour development. Apply when approximately 20% of fruit show pink to red colour development, normally 7-10 days before harvest.	7	A	NSW	-
Methyl Esters of Fatty Acids (Waiken)	PGR	Cherries	Registered in cherries to advance or delay budbreak. To advance budbreak, apply 35-50 days before budbreak would normally occur. To set back budbreak, apply from 20 days before budbreak would normally occur, up to the time of green tip.	NR	A	ALL	-
Paclobutrazol	PGR	Cherries / Trickle Irrigation or Collar Drench	Registered in cherries to reduce vegetative growth. Apply in early autumn or in spring between 14 days prior to budburst and full bloom. Bloom dates may be advanced. Do not re-treat until the season in which normal growth resumes.	NR	A	ALL	-
Cyanamide (Dormex) Nufarm	PGR		Registered for regulation of bud dormancy in apples, grapes, kiwi fruit, plums, almonds and walnuts.		P		-
Increase Fruit Size **Priority: High**							
Rated as a high priority in TAS, and not rated as a priority in other states.							
Aminoethoxyvinylglycine (Retain)	PGR	Cherries	Registered in cherries to extend flower viability by delaying flower and stigmatic senescence, thereby offering a better chance for pollination and fertilisation under poor set conditions which may result in better fruit set. Application must be made between 30-60% flowering/bloom.	7 G:14	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use	WHP (days)	Availability	States	Regulatory Risk
Forchlorfenuron	PGR	Cherries	Registered in cherries to increase fruit size. Apply when fruit are at green fruit stage (7-10 days after petal or shuck fall) or at straw fruit colour. Do not use more than 1 application per season. Do not apply later than crop growth stage BBCH 85.	NR NG	A	ALL	-
Gibberellic Acid	PGR	Cherries	Registered in cherries for the production of larger and firmer fruit with brighter colouration. Apply a single spray when fruit is early to mid-straw coloured. Colour development and harvest may be slightly delayed.	NR	A	ALL	-
Extend Shelf Life / Improve Fruit Quality **Priority: Moderate**							
Rated as a high priority in NSW and SA, and as a moderate priority in VIC and TAS.							
Aminoethoxyvinylglycine (Retain)	PGR	Cherries	Registered in cherries to extend flower viability by delaying flower and stigmatic senescence, thereby offering a better chance for pollination and fertilisation under poor set conditions which may result in better fruit set. Application must be made between 30-60% flowering/bloom.	7 G:14	A	ALL	-
Gibberellic Acid	PGR	Cherries	Registered in cherries for the production of larger and firmer fruit with brighter colouration. Apply a single spray when fruit is early to mid-straw coloured. Colour development and harvest may be slightly delayed.	NR	A	ALL	-
1-Methylcyclopropene (Smartfresh)	PGR		Registered as a post-harvest treatment for **improved quality after shipping, storage and handling** in apples, mango, apricots, broccoli, cabbage, carrot, cucumber, kiwifruit, melons, nectarines, persimmons, tomatoes, avocados, bananas, lettuce, papaya, pears and plums.		P		-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use	WHP (days)	Availability	States	Regulatory Risk
Fruit Thinning **Priority: Moderate**							
Rated as a moderate priority in VIC, NSW and TAS, and as a low priority in SA.							
Ammonium Thiosulphate	PGR		Registered for desiccation of blossoms and reduction of fruit set in apples, peaches and plums.		P		-

5. References

5.1 Information:

AgChem Access Priority Access Forum	https://www.agrifutures.com.au/national-rural-issues/agvet-chemicals/
Australian Pesticide and Veterinary Medicines Authority	www.apvma.gov.au
APVMA Chemical review	https://apvma.gov.au/chemicals-and-products/chemical-review/listing
APVMA MRLs	www.legislation.gov.au/Details/F2021C00634
APVMA Permit search	https://productsearch.apvma.gov.au/permits
APVMA Product search	https://productsearch.apvma.gov.au/products
Codex MRL database	http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/
Australian Cherry Production Guide	www.cherrygrowers.org.au/assets/australian_cherry_production_guide.pdf
Cotton Pest Management Guide 2021-22	https://www.cottoninfo.com.au/publications/cotton-pest-management-guide
CropLife Australia (Resistance Management)	https://www.croplife.org.au/resources/programs/resistance-management/
Growcom – Infopest Database	www.infopest.com.au
Hort Innovation	www.horticulture.com.au

5.2 Abbreviations and Definitions:

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

5.3 Acknowledgements:

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

6. Appendices:

Appendix 1. Products available for disease control in cherries
Appendix 2. Products available for control of insects and mites in cherries
Appendix 3. Products available for weed control in cherries
Appendix 4. Plant growth regulators available in cherries
Appendix 5. Current permits for use in cherries
Appendix 6. Cherry Maximum Residue Limits (MRLs)
Appendix 7. Cherry Agrichemical Regulatory Risk Assessment

Appendix 1. Products available for disease control in cherries

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Agrobacterium radiobacter var. *radiobacter* (NoGall) BASF	-	Stone Fruit	Crown Gall	ALL	NR	-
Bacillus amyloquefaciens strain QST 713 (Serenade Opti) Bayer PER88559	BM 01	Cherries / Field	Suppression of: Blossom Blight/Brown Rot (*Monilinia fructicola, M.laxa*); Bacterial Canker (*Pseudomonas* spp.); Brown Spot (*Alternaria alternata*); Bacterial Spot (*Xanthomonas* spp.); Botrytis Grey Mould (*Botrytis cinerea*)	ALL (excl. VIC)	NR	-
BLAD (Problad Plus)	BM 01	Stonefruit	Suppression Of: Brown Rot / Blossom Blight (*Monilinia* spp.)	ALL	NR	-
Bromo Chloro Dimethyl Hydantoin (BCDMH)	-	Sanitiser / Post-Harvest Treatment	External Rot Causing Organisms	ALL	NR	-
Captan	M4	Stone Fruit / Except Apricots	Blossom Blight (*Sclerotinia laxa*) Brown Rot (*Sclerotinia fructicola*)	ALL	NR	-
Chlorine	-	Sanitiser / Post-Harvest Treatment	Bacteria and Fungi	ALL	NR	-
Chlorothalonil (Bravo)	M5	Cherries	Brown Rot / Blossom Blight Shot-Hole Stone Fruit Rust Transit Rot	ALL	7	R3
Copper (Cu) present as Copper Ammonium Acetate	M1	Cherries	Shothole Freckle	ALL	1	-
			Bacterial Gummosis	NSW, VIC, TAS, SA & WA		

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Copper (Cu) present as Copper Hydroxide	M1	Cherries	Shothole Freckle	ALL	1	-
			Bacterial Gummosis	NSW, VIC, TAS, SA & WA		
Copper (Cu) present as Cuprous Oxide	M1	Cherries	Shothole	ALL	1	-
			Bacterial Gummosis	NSW, VIC, TAS, SA & WA		
Copper (Cu) present as Copper Oxychloride	M1	Stone Fruit	Blossom Blight Freckle Rust Leaf Curl Shot Hole	NSW, VIC, TAS, SA & WA	1	-
			Bacterial Spot Bacterial Canker Leaf Curl Shot Hole	QLD		
Copper (Cu) present as Tribasic Copper Sulfate	M1	Cherries	Shothole Bacterial Gummosis	ALL	1	-
Dithianon (Delan) BASF	M9	Stone Fruit	Shothole Scab / Peach Blight	ALL	21	R3
Fenhexamid (Teldor) PER88787	17	Cherries	Botrytis Grey Mould	ALL (excl. VIC)	1 G:14	-
Fludioxonil (Scholar) Syngenta	12	Stone Fruit / Post-Harvest	Brown Rot (*Monilinia* spp.) Grey Mould (*Botrytis cinerea*) Rhizopus Rot (*Rhizopus* spp.)	ALL	NR	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Stone Fruit	Blossom Blight Shot Hole Brown Rot	ALL	1	-

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Iodine	M	Stone Fruit / Post Harvest Dip	Bacteria & Fungi	ALL	NR	-
Iprodione	2	Stone Fruit	Blossom Blight (*Monilinia fructicola*, *Monilinia laxa*) Brown Rot (*Monilinia fructicola*, *Monilinia laxa*)	QLD, NSW, VIC, TAS, SA & WA	NR	R2
Mancozeb	M3	Stone Fruit / Except Wilson Plums	Brown Rot Freckle Rust Shot Hole	ALL	14	R2
Mandestrobin (Intuity) Sumitomo	11	Stone Fruit	Blossom Blight (*Monilinia laxa*) Brown Rot (*Monilinia fructicola*)	ALL	7 G:7	-
Metiram (Polyram) BASF	M3	Stone Fruit	Rust Shothole	ALL	14	R2
Penthiopyrad (Fontelis) Corteva	7	Stone Fruit	Brown Rot / Blossom Blight (*Monilinia* spp.) Scab / Freckle (*Cladosporium carpophilum*, *Venturia carpophila*)	ALL	NR	-
Peroxyacetic Acid	M	Sanitiser / Post-Harvest Treatment	Bacteria	ALL	NR	-
Procymidone (Sumisclex)	2	Stone Fruit	Blossom Blight (*Monilinia laxa*)	VIC, NSW, SA, TAS & QLD	9	R2
Propiconazole (Tilt)	3	Stone Fruit	Brown Rot / Blossom Blight (Blossom Phase) (*Monilinia laxa*)	VIC, WA & TAS	1	R3
			Brown Rot (Blossom Phase) (*Monilinia fructicola*)	NSW, SA, QLD, TAS & WA		
			Brown Rot (Fruit Phase) (*Monilinia fructicola*)	QLD, NSW, TAS, VIC, SA & WA		

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Cherries	Blossom Blight / Brown Rot	ALL	2	-
Sulphur	M2	Stone Fruit / Except Apricots	Rust	NSW, VIC, SA, WA & TAS	NR	-
			Brown Rot	NSW, VIC, SA & TAS		
Tebuconazole	3	Cherry / Pruning Wound Dressing	Silver Leaf	ALL	NR	R3
Thiram	M3	Stone Fruit	Brown Rot (Fruit) (*Monilinia fructicola*) Freckle (Apricot) (*Venturia carpophila*) Shot-Hole (*Stigmina carpophila*)	ALL	7	R2
Triforine	3	Cherry / Post-Harvest Dip	Brown Rot	SA & WA	NR	R3
Ziram	M3	Stone Fruit / Except Apricots	Blossom Blight Brown Rot Shot Hole Freckle Leaf Curl	ALL	7	R2

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

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
4-(P-Acetoxyphenyl)-2-Butanone + Malathion	1B	Fruit Fly Trap	Queensland Fruit Fly	ALL	NR	R3
4-(P-Acetoxyphenyl) -2-Butanone + Fipronil	2B	Fruit Trees / Fruit Fly Trap	Queensland Fruit Fly (*Bactrocera tryoni*) Lesser Queensland Fruit Fly (*Bactrocera neohumeralis*)	ALL	NR	R3
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Stone Fruit	Black Peach Aphid (*Brachycaudus persicae*) Green Peach Aphid (*Myzus persicae*) Light Brown Apple Moth (*Epiphyas postvittana*) Oriental Fruit Moth (*Grapholita molesta*) San Jose Scale (*Quadraspidiotus perniciosus*) Suppression Of: Mediterranean Fruit Fly (*Ceratitis capitata*) Queensland Fruit Fly (*Bactrocera tryoni*)	ALL	7	R2
Acequinocyl (Kanemite) UPL	20B	Stone Fruit	Two Spotted Mite (*Tetranychus urticae*)	ALL	14 NG	-
Bacillus thuringiensis subsp Kurstaki Strain HD-1	11	Fruit	Armyworm (*Spodoptera* spp.) Cotton Bollworm (*Helicoverpa armigera*) Native Budworm (*Helicoverpa punctigera*) Cabbage Moth (*Plutella xylostella*) Cabbage White Butterfly (*Pieris rapae*) Loopers Light Brown Apple Moth (*Epiphyas postvittana*) Vine Moth (*Agarista agricola*)	ALL	NR	-
Bifenthrin (Talstar) PER82062	3A	Cherries	Carpophilus Beetle	ALL (excl. VIC)	1	-
Chlorantraniliprole (Altacor) FMC	28	Stone Fruit	Oriental Fruit Moth (*Grapholita molesta*) Light Brown Apple Moth (*Epiphyas postvittana*)	ALL	14 NG	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Chlorantraniliprole (Altacor) FMC PER89259	28	Stone Fruit	Fall Armyworm (*Spodoptera frugiperda*)	ALL (excl. VIC)	14 NG	-
Chlorpyrifos (Lorsban)	1B	Stone Fruit	European Earwig	NSW, WA & ACT	14	R1
			San Jose Scale	QLD, WA, NSW & ACT		
Clofentezine (Apollo) Adama	10A	Stone Fruit	Two Spotted Mite (*Tetranychus urticae*) European Red Mite (*Panonychus ulmi*) Bryobia Mite (*Bryobis rubrioculus*)	ALL	21	-
Clothianidin (Samurai) Sumitomo	4A	Stone Fruit	Queensland Fruit Fly Mediterranean Fruit Fly Carpophilus Beetle	ALL	7 NG	R2
Cydia pomonella Granulosis Virus V22 (Grandex Biological Insecticide)		Stone Fruit	Codling Moth (*Cydia pomonella*) Oriental Fruit Moth (*Grapholita molesta*)	ALL	NR	-
Diazinon	1B	Stone Fruit / Dormant	San Jose Scale	ACT, NSW, WA, SA & VIC	14	R3
		Stone Fruit	San Jose Scale			
			Green Peach Aphid Black Cherry Aphid	ACT, NSW, SA & WA		
Diazinon PER84533	1B	Cherries	Black Cherry Aphid	TAS	14	R3
Dimethoate PER13859	1B	Fruit Fly Host Crops / Non-Bearing Only	Fruit Fly	ALL	NR	R1

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Dodecadien-1-ol, Dodecanol, Tetradecanol, Dodecenyl Acetate (Isomate)	-	Cherries / Insect Confusion Agent	Oriental Fruit Moth (*Cydia molesta*) Codling Moth (*Cydia pomonella*)	SA, VIC, NSW, QLD & TAS	NR	-
Etofenprox (Trebon) Sipcam	3A	Stone Fruit	Queensland Fruit Fly Mediterranean Fruit Fly	ALL	3 NG	-
Etoxazole (Paramite) Sumitomo	10B	Stone Fruit	Two-Spotted Mite (*Tetranychus urticae*) European Red Mite (*Panonychus ulmi*) Bryobia Mite (*Bryobia rubrioculus*)	ALL	7 NG	R3
Fenitrothion	1B	Cherries	Spur-Throated Locust Migratory Locust Wingless Grasshopper	NSW, VIC, SA & WA	14 G:14	-
			Australian Plague Locust	NSW, QLD, VIC, SA & WA		
Fipronil (Amulet) BASF	2B	Stone Fruit	Queensland Fruit Fly (*Bactrocera tryoni*)	ALL	NR	R3
Fipronil PER86492	2B	Orchards / Bait	European Wasp (*Vespula germanica*) Common Wasp (*Vespula vulgaris*)	ALL	NR	R3
Garlic + Chilli + Pyrethrins + Piperonyl Butoxide	3A	Fruit Tree	Suitable for organic growers. Broad spectrum activity including ants, aphids, caterpillars, earwigs, whitefly, thrips and leafhopper.	ALL	1	-
Hexythiazox (Calibre) Nufarm	10A	Stone Fruit	Two Spotted Mite European Red Mite	ALL	3	-
Imidacloprid (Confidor)	4A	Stone Fruit	Green Peach Aphid Black Peach Aphid	ALL	21 NG	R2

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Indoxacarb (Avatar) FMC	22A	Cherries	European Earwig Oriental Fruit Moth Inland Katydid Light Brown Apple Moth Pear & Cherry Slug Apple Weevil Fuller's Rose Weevil Garden Weevil Wingless Grasshopper Garden Weevil	ALL	14	R3
Indoxacarb (Avatar) FMC PER11002	22A	Cherries	European Earwig	NSW, SA, TAS & WA	14	R3
Indoxacarb (Avatar) FMC PER89278	22A	Cherries	Fall Armyworm	ALL (excl. VIC)	14	R3
Iron EDTA Complex	-	All plants	Snails & Slugs	ALL	NR	-
Liquid Paraffin (Heavy Paraffinic Dormant Spray Oil)	-	Stone Fruit	San Jose Scale	VIC, SA, WA, NSW, ACT & QLD	1	-
			Bryobia Mites European Red Mites	VIC, SA, TAS, NSW, ACT & QLD		
			Bryobia Mites	WA		
			Oystershell Scale Prune Scale	TAS		

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Maldison (Fyfanon)	1B	Stone Fruit	Black Peach Aphid Green Peach Aphid European Red Mite Oriental Fruit Moth	NSW, ACT, VIC, TAS, SA & WA	3	R3
Maldison (Fyfanon)	1B	Fruit Tree / Fruit Fly Bait Spray	Fruit Flies	ALL	3	R3
Methiocarb (Mesurol) Bayer	1A	Stone Fruit	Slugs Snails	ALL	7 G:28	-
Methomyl (Lannate)	1A	Stone Fruit	Thrips Green Peach Aphid (*Myzus persicae*) Budworm (*Helicoverpa* spp.) Monolepta Beetle	ALL	1	R2
Methomyl (Lannate) PER89293	1A	Stone Fruit	Fall Armyworm (*Spodoptera frugiperda*)	ALL	1	R2
Milbemectin (Milbeknock)	6	Stone Fruit	Two Spotted Mite (*Tetranychus urticae*)	ALL	14 NG	-
Petroleum Oil	-	Stone Fruit	San Jose Scale Oyster Shell Scale Bryobia Mite Eggs European Mite Eggs	ALL	1	-
			Two-Spotted Mite	NSW & QLD		
Pirimicarb (Pirimor)	1A	Stone Fruit	Green Peach Aphid Black Peach Aphid Cherry Aphid	ALL	2	R3

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Potassium Salts of Fatty Acid (Natrasoap)	-	Fruit Trees	Aphids Thrips Mealybug Two-Spotted Mite Spider Mite Whitefly	ALL	NR	-
Propargite (Omite)	12C	Stone Fruit	Two Spotted Mite	ALL	7	R3
			European Red Mite	QLD, WA		
Pymetrozine (Chess) Syngenta	9B	Stone Fruit	Black Peach Aphid (*Brachycaudus persicae*) Green Peach Aphid (*Myzus persicae*)	ALL	28	R3
Pyrethrin (Pyganic) Sumitomo	3A	Stone Fruit	Fruit Fly Rutherglen Bug Spiders	ALL	NR	-
Spinetoram (Delegate) Corteva	5	Stone Fruit	Pear and Cherry Slug Light Brown Apple Moth Oriental Fruit Moth Western Flower Thrips	ALL	3 NG	-
Spinetoram (Delegate) Corteva PER89241	5	Stone Fruit	Fall Armyworm (*Spodoptera frugiperda*)	ALL (excl. VIC)	3 NG	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Spinetoram (Delegate) Corteva PER12590	5	Stone Fruit	Suppression Of: Queensland Fruit Fly (*Bactrocera tryoni*) Lesser Queensland Fruit Fly (*Bactrocera neohumeralis*)	ACT, NSW, QLD & NT	3	-
			Mediterranean Fruit Fly (*Ceritatis capitata*)	WA		
			Where an incursion occurs for a fruit fly species not recorded as endemic within a state/territory	ALL (excl. VIC)		
Spinosad (Naturalure) Corteva	5	Tree, Fruit, Nut, Vine & Vegetable Crops / Fruit Fly Bait	Queensland Fruit Fly *(Bactrocera tryoni)* Mediterranean Fruit Fly *(Ceratitis capitata)*	ALL	NR	-
Spinosad (Entrust Organic) Corteva	5	Stone Fruit / Except Peaches	Cherry Slug Light Brown Apple Moth Western Flower Thrips Oriental Fruit Moth	ALL	3 G:14	-
Spinosad (Entrust Organic) Corteva PER89870	5	Stone Fruit / Except Peaches	Fall Armyworm (*Spodoptera frugiperda*)	ALL (excl. VIC)	3 G:14	-
Spirotetramat (Movento) Bayer	23	Stone Fruit	Tuber Mealybug (*Pseudococcus virburni*) Long Tailed Mealybug (*Pseudococcus longispinus*) Black Cherry Aphid (*Myzus cerasi*) Black Peach Aphid (*Brachycaudus persicae*) Sane Jose Scale (*Quadraspidiotus perniciosus*)	ALL	21	-
Spirotetramat (Movento) Bayer PER84804	23	Stone Fruit	Western Flower Thrips (*Frankliniella occidentalis*)	ALL (excl. VIC)	21	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Sulfoxaflor (Transform) Corteva	4C	Stone Fruit	Apple Dimpling Bug Cherry Aphid Green Peach Aphid Black Peach Aphid	ALL	7	-
Tau-Fluvalinate (Mavrik)	3A	Cherries	Plague Thrips	QLD, NSW, VIC, SA & WA	NR	-
Tetraniliprole (Vayego) Bayer	28	Stone Fruit	Apple Weevil (*Otiorhynchus cribricollis*) Fuller's Rose Weevil (*Asynonychus cervinus*) Garden Weevil (*Phlyctinus callosus*) Oriental Fruit Moth (*Grapholita molesta*) Mediterranean Fruit Fly (*Ceratitis capitata*) Suppression of: Dried Fruit Beetle (*Carpophilus* spp.)	ALL	3 NG	-
Thiacloprid (Calypso) Bayer	4A	Stone Fruit	Oriental Fruit Moth	ALL	14 NG	R2
Thiacloprid (Calypso) Bayer PER14562	4A	Stone Fruit / Excluding Peaches	Mediterranean Fruit Fly (*Ceratitis capitata*)	WA	14 NG	R2
Trichlorfon (Lepidex)	1B	Stone Fruit	Queensland Fruit Fly	QLD, NSW, VIC, WA & NT	2	R2
			Rutherglen Bug	NSW, VIC, TAS, SA & WA		
Trichlorfon (Lepidex) PER80542	1B	Stone Fruit	Queensland Fruit Fly Mediterranean Fruit Fly	SA	2	R2
Trichlorfon (Lepidex) PER14683	1B	Stone Fruit	Fruit Flies	ALL (excl. VIC)	7	R2

Appendix 3. Products available for weed control in cherries

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
2,2-DPA	0**	Cherries	Annual and Perennial Grasses	7	ALL	-
Amitrole	34**	Orchards / Directed Spray	Grass and Broadleaf Weeds	56	ALL	-
Carfentrazone (Hammer)	14**	Stone Fruit / Directed Spray	Broadleaf Weeds	NR G:14	ALL	-
Clethodim (Select)	1***	Non-Bearing Fruit Tree	Annual Ryegrass (*Lolium rigidum*), Annual Phalaris (*Phalaris minor*), Barley Grass (*Hordeum leporinum*), Barnyard Grass (*Echinochloa* spp.), Blown Grass (*Agrostis avenacea*), Brome Grass (*Bromus diandrus*), Crowsfoot Grass (*Eleusine indica*), Feathertop Rhodes Grass (*Chloris virgata*), Liverseed Grass (*Urochloa panicoides*), Paradoxa Grass (*Phalaris paradoxa*), Red Sprangletop Grass (*Leptochloa filiformis*), Seedling Johnson Grass (*Sorghum halepense*), Summer Grass (*Digitaria* spp.), Volunteer Sorghum (*Sorghum* spp.), Volunteer Wheat (*Triticum aestivum*), Volunteer Oats (*Avena sativa*), Volunteer Barley (*Hordeum vulgare*), Winter Grass (*Poa annua*) Suppression of: Silver Grass (*Vulpia bromoides*) (not QLD, WA)	NR	ALL	R3
Dichlobenil (Casoran)	29**	Orchards / Residual Weed Control	Annual Grass and Broadleaf Weeds	NR	ALL	-

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Fluazifop-P (Fusilade)	1***	Stone Fruit / Directed Spray or Shielded Spray	Annual Ryegrass, Barley Grass, Barnyard Grass, Brome Grasses, Crowsfoot Grass, Johnson Grass, Liverseed Grass, Prairie Grass, Summer Grass (Crabgrass), Wild Oats, Innocent Weed, Stinkgrass, Pigeon Grass and Foxtail (*Setaria* spp.) seedlings. Established plants of: Bent Grass, Couch Grass, English Couch (Rope Twitch), Water Couch, Johnson Grass, Kikuyu Grass, Paspalum	NR	ALL	-
Flumioxazin (Chateau) Sumitomo	14**	Stone Fruit / Directed Spray / Residual Weed Control	Annual Ryegrass (*Lolium rigidum*), Barnyard Grass (*Echinochloa colona*), Blackberry Nightshade (Solanum nigrum), Bluetop (*Ageratum houstonianum*), Capeweed (*Crassula colorata*), Creeping Speedwell (*Veronica persica*), Crowsfoot (*Eleusine indica*), Dwarf Nettle or Stinging Nettle (*Urtica urens*), Fat Hen (*Chenopodium album*), Feathertop Rhodes Grass (*Chloris virgata*), Fleabane (*Conyza bonariensis*), Green Summer Grass (*Brachiaria subquadripara*), Hog Weed (*Polygonum aviculare*), Marshmallow (*Malva parviflora*), Milk Thistle (*Sonchus oleraceus*), Pigweed (*Portulaca oleracea*), Small Flowered Mallow (*Modiola caroliniana*), Squirreltail Fescue (*Vulpia bromoides*), Summer Grass (*Digitaria ciliaris*), Toadrush (*Juncus bufonius*), Wild Mustard (*Sinapis arvensis*), Wild Radish (*Raphanus raphanistrum*), Wild Rose (*Cleome aculeate*), Wild Turnip (*Brassica tournefortii*)	98 G:28	ALL	-
Glufosinate (Basta)	10**	Stone Fruit / Directed or Shielded Spray	Do not allow spray to contact any part of the tree, including the trunk. Grass and broadleaf weeds.	21 G:56	ALL	R3

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Glyphosate (Roundup)	9**	Stone Fruit / Over 3 Years Old / Directed Spray, Shielded Spray or Wick Wiper	Do not allow spray to contact any part of the tree, including the trunk. Grass and broadleaf weeds.	NR	ALL	R3
Haloxyfop (Verdict)	1***	Stone Fruit / Directed Spray	Couch, Rhodes Grass, Slender Rats Tail Grass, Buffel Grass, Green Panic, Johnson Grass, Kikuyu, Paspalum spp., Setaria spp., Annual Ryegrass, Barley Grass, Barnyard Grass, Brome Grass, Crowsfoot Grass, Lesser Canary Grass, Liverseed Grass, Mossman River Grass, Paradoxa Grass, Summer Grass, Volunteer Cereals, Wild Oats	NR	ALL	-
Isoxaben (Gallery) Corteva	29**	Bearing and Non-Bearing Fruit Tree / Residual Weed Control	Broadleaf Weeds.	NR	ALL	-
Napropamide (Devrinol)	0**	Stone Fruit / Residual Weed Control	Annual Ryegrass, Barnyard Grass, Crowsfoot Grass, Innocent Weed, Liverseed Grass, Pigweed, Potato Weed, Redshank, Sowthistle, Stinkgrass, Summer Grass, Winter Grass	NR NG	ALL	-

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Norflurazon (Zoliar) AgNova	12**	Stone Fruit	Annual Ryegrass, Barley Grass, Blackberry Nightshade, Brachiaria (Green Summer Grass), Caltrop, Capeweed, Chickweed, Common Sowthistle, Dandelion, Curled Dock, False Caper, Fat Hen, Indian Hedge Mustard, Innocent Weed, Medic, Hedge Mustards, Paspalum, Plantain Seedlings, Pigweed, Prairie Grass, Prickly Lettuce, Great Brome, Salvation Jane, Scarlet Pimpernel, Shepherd's Purse, Silver Grass, Skeleton Weed, Sorrel, Soursob, Stinkgrass, Stinking Roger, Subterranean Clover, Summer Grass (Crabgrass), Spiny Emex, Variegated Thistle, Wild Oats, Wild Radish, Wild Turnip, Winter Grass, Wireweed, Witch Grass, Yellow Weed, Yorkshire Fog Grass, Couch Grass, Johnson Grass, Barnyard Grass, Clammy Goosefoot, Cobbler's Pegs, Green Pigeon Grass, Redroot Amaranth	NR	ALL	-
Oryzalin	3**	Stone Fruit / Residual Weed Control	Barnyard Grass, Guinea Grass, Love Grass, Paradoxa Grass, Pigeon Grass, Spiny Burr Grass, Summer Grass, Deadnettle, Fathen Fumitory, Pigweed, Sowthistle, Wireweed, Blackberry Nightshade, Caltrop, Paddymelon, Silverleaf Nightshade.	NR	ALL	-
Oxyfluorfen (Goal)	14**	Stone Fruit / Directed Spray	Grass and broadleaf weeds. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Annual Grass and broadleaf weeds	1 G:7	ALL	R3

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Paraquat + Amitrole (Guerrilla)	22** + 34**	Orchards / Directed Spray	Annual Weeds Capeweed or *Erodium* spp.	NR G:1	QLD, VIC, SA, WA, TAS and NT	R3
			Annual Weeds Fat Hen Pigweed		NSW	
			Flaxleaf Fleabane		ALL	
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray	Grass and Broadleaf Weeds	G:1	ALL	R3
Pendimethalin (Stomp)	3**	Deciduous Fruits / Directed Spray / Residual Weed Control	Do not allow spray to contact any part of the tree, including the trunk. Grass and broadleaf weeds.	NR	ALL	-
Trifluralin	3**	Orchards / Pre-Plant Residual	Grass and Broadleaf Weeds	NR	QLD, SA, WA, VIC & TAS	-

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

Appendix 4. Plant growth regulators available in cherries

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use	WHP (days)	States	Regulatory risk
Aminoethoxyvinylglycine (Retain)	Plant Growth Regulator	Cherries	Increase fruit firmness, size, and increase fruit quality and storage potential.	7 G:14	ALL	-
Ethephon	Plant Growth Regulator	Cherries	Promote evenness of maturity, early colour development.	7	NSW	-
Forchlorfenuron	Plant Growth Regulator	Cherries	Increase fruit size	NR NG	ALL	-
Gibberellic Acid	Plant Growth Regulator	Cherries	Promote desirable harvest effects	NR	ALL	-
Gibberellins + 6-Benzyladenine (Cytolin)	Plant Growth Regulator	Cherries	Stimulation of lateral growth on non-bearing trees.	NR	ALL	-
Methyl Esters of Fatty Acids (Waiken)	Plant Growth Regulator	Cherries	Advance bud break	NR	ALL	-
Paclobutrazol	Plant Growth Regulator	Cherries	Reduce vegetative growth	NR	ALL	-
Prohexadione-Calcium (Regalis)	Plant Growth Regulator	Cherries	Shoot growth reduction	28 G:56	ALL	-

Appendix 5. Current permits for use in cherries

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER88559 Version 2	*Bacillus amyloquefaciens* strain QST 713 (Serenade Opti) / Cherries (field) / Blossom Blight/Brown Rot, Bacterial Canker, Brown Spot, Bacterial Spot, Botrytis Grey Mould	4-Aug-20	31-Aug-24	Hort Innovation
PER82062 Version 3	Bifenthrin / Cherries / Carpophilus Beetle	19-Nov-15	31-Dec-23	Hort Innovation
PER89259 Version 2	Chlorantraniliprole / Stone Fruit / Fall Armyworm	6-Mar-20	31-Mar-23	Hort Innovation
PER84533 Version 2	Diazinon / Cherries / Black Cherry Aphid	15-Aug-17	31-May-24	Hort Innovation
PER13859 Version 2	Dimethoate/ Orchard clean-up - fruit fly host crops following harvest / Fruit Fly	09-Feb-15	31-Jul-24	Hort Innovation
PER88787 Version 2	Fenhexamid (Teldor) / Cherries / Botrytis Grey Mould	5-Nov-19	30-Nov-23	Hort Innovation
PER11002 Version 3	Indoxacarb (Avatar) / Cherries / European Earwig	14-May-09	31-Mar-25	Hort Innovation
PER89278	Indoxacarb (Avatar) / Cherries / Fall Armyworm	13-Mar-20	31-Mar-23	Hort Innovation
PER89293	Methomyl (Lannate) / Cherries / Fall Armyworm	10-Apr-20	30-Apr-23	Hort Innovation
PER89241	Spinetoram (Delegate) / Stone Fruit / Fall Armyworm	6-Mar-20	31-Mar-23	Hort Innovation
PER12590 Version 4	Spinetoram (Delegate) / Stone Fruit / Fruit Fly	6-Oct-11	31-May-24	Hort Innovation
PER89870	Spinosad (Entrust Organic) / Stone Fruit / Fall Armyworm	21-Jul-20	31-Jul-23	Hort Innovation
PER84804 Version 2	Spirotetramat (Movento) / Stone Fruit / Western Flower Thrips	21-Jul-17	28-Feb-24	Hort Innovation
PER14562 Version 2	Thiacloprid (Calypso) / Stone Fruit / Mediterranean Fruit Fly (WA Only)	13-Dec-13	30-Sep-23	Hort Innovation
PER80542 Version 2	Trichlorfon / Cherries / Fruit Flies	1-Apr-15	31-Mar-25	Hort Innovation
PER14683 Version 3	Trichlorfon / Stone Fruit / Fruit Fly	24-Feb-15	31-Mar-27	Hort Innovation

Appendix 6. Cherry Maximum Residue Limits (MRLs)

CODEX commodity groupings of stone fruits and subgroups:

FS 0012 Stone fruits
FS 0013 Cherries
FS 0244 Cherry, Sweet
Fruit

Note: Australia exported 23% of total production in 2020/21. The main destinations for these cherries were Hong Kong, China, Vietnam, Singapore and Taiwan. Available information indicates that in the absence specific limits in legislation that most countries defer to Codex, followed by EU MRL standards or apply a 0.01 ppm 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	FS 0012	Stone Fruits	1	-
2,4-D	FS 0013	Cherries	*0.05	-
	FS 0012	Stone Fruits	-	*0.05
Abamectin	FS 0013	Cherries	-	0.07
Acetamiprid	FS 0013	Cherries	2	1.5
Acequinocyl	FS 0012	Stone Fruits	0.7	-
Aldrin and Dieldrin		Fruits	E0.05	-
Aminoethoxyvinylglycine	FS 0013	Cherries	*0.05	-
Amitraz	FS 0013	Cherries	-	0.5
Amitrole	FS 0012	Stone Fruits	*0.02	*0.05
Azoxystrobin	FS 0012	Stone Fruits	-	2
Bifenazate	FS 0012	Stone Fruits	-	2
Bifenthrin	FS 0013	Cherries	T3	-
Bitertanol	FS 0013	Cherries	-	1
Boscalid	FS 0013	Cherries	T3	-
	FS 0012	Stone Fruits	-	3
Bromide Ion		Fruits	-	20
Buprofezin	FS 0013	Cherries	-	2
Captan	FS 0012	Stone Fruits	15	-
	FS 0013	Cherries	-	25
Carbendazim	FS 0013	Cherries	-	10
Carfentrazone-ethyl	FS 0012	Stone Fruits	*0.05	-
Chlorantraniliprole	FS 0012	Stone Fruits	1	1
Chlordane	FS 0012	Stone Fruits	E0.02	-
Chlorothalonil	FS 0013	Cherries	10	3
Chlorpyrifos	FS 0012	Stone Fruits	T1	-
Chlorpyrifos-Methyl	FS 0012	Stone Fruits	-	0.5
Clofentezine	FS 0012	Stone Fruits	0.1	0.5
Clothianidin	FS 0012	Stone Fruits	3	0.2
Cyantraniliprole	FS 0013	Cherries	-	6
Cycloxydim	FS 0012	Stone Fruits	-	*0.09
Cyhalothrin	FS 0013	Cherries	-	0.3
Cypermethrins	FS 0012	Stone Fruits	-	2

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Cyprodinil	FS 0012	Stone Fruits	*0.01	2
DDT		Fruits	E1	-
Diazinon		Fruits {except Citrus fruits; Grapes; Olives; Peach}	0.5	-
	FS 0013	Cherries	-	1
Dichlobenil	FS 0012	Stone Fruits	0.1	-
Dicofol		Fruits {except Strawberry}	5	-
Difenoconazole	FS 0013	Cherries	-	0.2
Dimethoate	FS 0013	Cherries	-	2
Diphenylamine		Fruits {except Apple; Pear}	0.5	-
Diquat		Fruits	*0.05	-
	FS 0012	Stone Fruits	-	*0.02
Dithianon		Fruits {except Blueberries}	2	-
	FS 0012	Stone Fruits	-	2
Dithiocarbamates	FS 0012	Stone Fruits	3	7
	FS 0013	Cherries	-	0.2
Diuron	FS 0012	Stone Fruits	*0.05	-
Dodine	FS 0013	Cherries	-	3
Ethephon	FS 0013	Cherries	15	5
Ethion	FS 0012	Stone Fruits	1	-
Fenarimol	FS 0013	Cherries	-	1
Fenazaquin	FS 0013	Cherries	-	2
Fenbuconazole	FS 0013	Cherries	-	1
Fenbutatin Oxide	FS 0013	Cherries	-	10
Fenhexamid	FS 0013	Cherries	T7	7
Fenitrothion	FS 0013	Cherries	1	-
Fenpyrazamine	FS 0013	Cherries	-	3
Fenpyroximate	FS 0013	Cherries	-	2
Fenthion	FS 0013	Cherries	-	2
Fipronil	FS 0012	Stone Fruits	*0.01	-
Flonicamid	FS 0013	Cherries	-	0.9
Fluazifop-p-butyl	FS 0012	Stone Fruits	0.05	*0.01
Flubendiamide	FS 0012	Stone Fruits	-	2
Fludioxonil	FS 0012	Stone Fruits	5	Po5
Flumioxazin	FS 0012	Stone Fruits	*0.02	*0.02
Fluopyram	FS 0013	Cherries	3	2
Flupyradifurone	FS 0013	Cherries	-	2
Flutriafol	FS 0013	Cherries	-	0.8
Fluvalinate	FS 0012	Stone Fruits	0.05	-
Fluxapyroxad	FS 0013	Cherries	3	3
Forchlorfenuron	FS 0013	Cherries	*0.01	-
Glufosinate	FS 0012	Stone Fruits	*0.05	0.15
Glyphosate	FS 0012	Stone Fruits	0.2	-
Haloxyfop	FS 0012	Stone Fruits	*0.05	*0.02
Hexythiazox	FS 0012	Stone Fruits	1	0.3
Imidacloprid	FS 0012	Stone Fruits	0.5	-
	FS 0013	Cherries	-	4

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Indoxacarb	FS 0013	Cherries	1	-
	FS 0012	Stone Fruits	-	1
Inorganic Bromide		Fruits {except Avocado; Citrus fruits; Dried fruits; Strawberry}	20	-
Iprodione	FS 0012	Stone Fruits	10	-
	FS 0013	Cherries	-	10
Isofetamid	FS 0013	Cherries	-	4
Isoxaben	FS 0012	Stone Fruits	*0.01	-
Lindane	FS 0013	Cherries	E0.5	-
Maldison / Malathion	FS 0012	Stone Fruits	5	-
	FS 0013	Cherries	-	3
Mandestrobin	FS 0012	Stone Fruits	3	-
Metalaxyl	FS 0012	Stone Fruits	0.2	-
Metaldehyde		Fruits	1	-
Methidathion	FS 0013	Cherries	-	0.2
Methiocarb		Fruits {except Citrus fruits; Grapes}	T0.1	-
Methomyl	FS 0013	Cherries	2	-
Methoxyfenozide	FS 0012	Stone Fruits	-	2
Methyl Bromide		Fruits {except Jackfruit; Litchi; Mango; Papaya [pawpaw]}	T*0.05	-
Metrafenone	FS 0013	Cherries	-	2
Milbemectin	FS 0012	Stone Fruits	0.1	-
Myclobutanil	FS 0013	Cherries	-	3
Napropamide	FS 0012	Stone Fruits	*0.1	-
Norflurazon	FS 0012	Stone Fruits	*0.2	-
Novaluron	FS 0013	Cherries	3	-
	FS 0012	Stone Fruits	-	7
Oryzalin		Fruits	0.1	-
Oxyfluorfen	FS 0012	Stone Fruits	0.05	-
Paclobutrazol	FS 0012	Stone Fruits	*0.01	-
Paraquat		Fruits {except Olives}	*0.05	-
	FS 0012	Stone Fruits	-	*0.01
Pendimethalin	FS 0012	Stone Fruits	*0.05	-
Penthiopyrad	FS 0012	Stone Fruits	5	4
Permethrin	FS 0012	Stone Fruits	-	2
Piperonyl Butoxide		Fruits	8	-
Pirimicarb		Fruits {except Blackberries}	0.5	-
	FS 0012	Stone Fruits	-	3
Procymidone	FS 0012	Stone Fruits	T10	-
Prohexadione-Calcium	FS 0013	Cherries	*0.01	-
Propargite	FS 0012	Stone Fruits	3	4
Propiconazole	FS 0012	Stone Fruits	2	-
	FS 0013	Cherries	-	Po3
Pymetrozine	FS 0012	Stone Fruits	*0.05	-
Pyraclostrobin	FS 0013	Cherries	1	3
Pyrethrins		Fruits	1	-
Pyridaben	FS 0012	Stone Fruits	0.5	-
Pyrimethanil	FS 0013	Cherries	-	Po4

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Quinoxyfen	FS 0013	Cherries	-	0.4
Saflufenacil	FS 0012	Stone Fruits	-	0.01
Simazine		Fruits	*0.1	-
Spinetoram	FS 0012	Stone Fruits	0.2	-
	FS 0013	Cherries	-	0.09
Spinosad	FS 0012	Stone Fruits	1	0.2
Spirodiclofen	FS 0012	Stone Fruits	-	2
Spirotetramat	FS 0012	Stone Fruits	1	3
Sulfoxaflor	FS 0013	Cherries	3	1.5
Tebuconazole	FS 0012	Stone Fruits	*0.01	-
	FS 0013	Cherries	-	4
Tetraniliprole	FS 0013	Cherries	1	-
Thiacloprid	FS 0012	Stone Fruits	2	0.5
Thiamethoxam	FS 0012	Stone Fruits	-	1
Trichlorfon	FS 0012	Stone Fruits	T3	-
Trifloxystrobin	FS 0012	Stone Fruits	5	3
Triflumizole	FS 0013	Cherries	-	4
Trifluralin		Fruits	*0.05	-
Triforine	FS 0012	Stone Fruits	10	-

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

* Indicates that an MRL is at the Limit of Quantitation (LOQ)
T =Temporary MRL
E = The MRL is based on extraneous residues

Sources: APVMA MRLs: Agricultural and Veterinary Chemicals Code (MRL Standard) Instrument 2019. Compilation 23. Prepared 4 February 2022. CODEX MRLs: CODEX Alimentarius International Food Standards database (February 2022), http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/

Appendix 7. Cherry Agrichemical Regulatory Risk Assessment

Cherry
Agrichemical Regulatory
Risk Assessment

March 2022

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

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

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

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

Cherry Agrichemical Regulatory Risk Assessment

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

Active Constituents	Chemical Group	Problem	Comment
INSECT AND MITE PESTS			
Abamectin	**6**	Fruit flies (PER91073 – SA Biosecurity) (Bait spray)	
Acetamiprid + novaluron	**4A + 15**	Black peach aphid	Acetamiprid APVMA: Under review
		Fruit flies	
		Green peach aphid	
		Oriental fruit moth	
		San Jose scale	
		Light brown apple moth	
Bifenthrin	**3A**	Dried fruit beetle	Canada: Not authorised EU: Not authorised
		Carpophilus beetle (PER82062)	
		Brown marmorated stink bug (PER82374) Biosecurity pest	
		Yellow spotted stink bug (PER82374) Biosecurity pest	
Chlorantraniliprole	**28**	Light brown apple moth	
		Oriental fruit moth	
		Fall armyworm (PER89259)	
Chlorpyrifos	**1B**	European earwig	APVMA: Under review. Codex: Scheduled for review by JMPR Canada: Cancellation of all uses. EU: No authorisation in place[i] USA: EPA decision to cancel use on food crops
		Light brown apple moth	
		Queensland fruit fly	
		San Jose scale	
		Locusts(PER11843)	

Active Constituents	Chemical Group	Problem	Comment
Clofentezine	**10A**	Bryobia mite	
		European red mite	
		Two-spotted (Red spider) mite	
Clothianidin	**4A**	Fruit flies	APVMA: Under review Canada: Field uses cancelled or amended EU: Not authorised USA: Re-registration with new risk mitigation measures
Cydia pomonella granulosis virus	**31**	Oriental fruit moth	
Deltamethrin	**3A**	Mediterranean fruit fly (PER90359 – WA) Use as trap toxicant	
Diazinon	**1B**	Green peach aphid	APVMA: Under review EU: No authorisation in place Codex: JMPR re-evaluation scheduled
		San Jose scale	
		Cherry aphid (PER84533)	
Dimethoate	**1B**	Fruit flies (PER13859) Post-harvest orchard clean-up	Codex: MRL deletion recommended. EU: Not authorised
Etoxazole	**10B**	Two-spotted (Red spider) mite	EU: Only uses on greenhouse ornamentals approved & Candidate for substitution
Fenitrothion	**1B**	Locusts	EU: No authorisation in place
		Small plague grasshopper	
		Wingless grasshopper	
Fipronil	**2B**	European earwig (PER13131)	APVMA: Under review Codex: Re-evaluation underway EU: No authorisation in place
Hexythiazox	**10A**	European red mite	
		Two-spotted (Red spider) mite	
Imidacloprid	**4A**	Black peach aphid	APVMA: Under review Canada: Field uses cancelled or amended EU: No authorisation in place expiry of the grace periods (June 2022), USA: Re-registration with new risk mitigation measures
		Green peach aphid	
		Pear and cherry slug	

Active Constituents	Chemical Group	Problem	Comment
Indoxacarb	**22A**	European earwig (PER11002)	EU: Authorisation not renewed. Grace period expires September 2022
		Fall armyworm (PER89278)	
Lambda-cyhalothrin	**3A**	Fruit flies (PER12961 – SA Biosecurity) (Soil drench)	EU: Candidate for substitution
Malathion/Maldison	**1B**	Fruit flies	APVMA: nominated for review Canada: Re-evaluation completed. Majority of uses removed EU: No authorisations in place
		Black peach aphid	
		Cherry aphid	
		European red mite	
		Green peach aphid	
		Oriental fruit moth	
		Rutherglen bug	
		Wingless grasshopper	
		Locusts (PER11843)	
Methomyl	**1A**	Green peach aphid	
		Helicoverpa	
		Red-shouldered leaf beetle	
		Thrips	
		Fall armyworm (PER89293)	
Milbemectin	**6**	Two-spotted (Red spider) mite	
Paraffinic/petroleum oil	**UNM**	Bryobia mite	
		European red mite	
		Mites	
		San Jose scale	
		Scale insects (Frosted, Oystershell & pear)	
		Spider mites	
		Two-spotted (Red spider) mite	
Pirimicarb	**1A**	Black peach aphid	
		Cherry aphid	
		Green peach aphid	

Active Constituents	Chemical Group	Problem	Comment
Propargite	**12C**	European red mite	
		Mites	
		Two-spotted (Red spider) mite	
Pymetrozine	**9B**	Black peach aphid	
		Green peach aphid	
Pyrethrins	**3A**	Black citrus aphid	
		Caterpillars	
		Fruit flies	
		Green peach aphid	
		Greenhouse whitefly	
		Light brown apple moth	
		Pear and cherry slug	
		Plague thrips	
		Rutherglen bug	
Pyridaben	**21A**	European red mite	
		Two-spotted (Red spider) mite	
Spinetoram	**5**	Caterpillars	
		Light brown apple moth	
		Oriental fruit moth	
		Pear and cherry slug	
		Western flower thrips	
		Fruit flies (PER12590/PER89241)	
		Fall armyworm	
Spinosad	**5**	Light brown apple moth	
		Oriental fruit moth	
		Pear and cherry slug	
		Western flower thrips	
		Fall armyworm (PER89870)	

Active Constituents	Chemical Group	Problem	Comment
Spirotetramat	**23**	Black peach aphid	
		Cherry aphid	
		Long tailed Mealybugs	
		San Jose scale	
		Tuber mealybug	
		Western flower thrips (PER84804)	
Sulfoxaflor	**4C**	Apple dimpling bug	USA: Pollinator concerns EU: Restricted to permanent glasshouses only
		Black peach aphid	
		Cherry aphid	
		Green peach aphid	
Sulfur	**UN**	San Jose scale	
Tau-fluvalinate	**3A**	Plague thrips	
Thiacloprid	**4A**	Green peach aphid	APVMA: Under review EU: No authorisation in place USA: No authorisation
		Oriental fruit moth	
		Mediterranean fruit fly (PER14562)	
Trichlorfon	**1B**	Rutherglen bug	APVMA: nominated for review Codex: No MRLs EU: No authorisations
		Queensland fruit fly	
		Fruit flies (PER80542)	

Active Constituents	Chemical Group	Problem	Comment
DISEASES			
Agrobacterium radiobacter		Crown gall	
Bacillus amyloquefaciens	**BM02**	Bacterial canker/blast (PER88559)	
		Bacterial spot (PER88559)	
		Blossom blight (PER88559)	
		Brown spot (Alternaria) (PER88559)	
		Grey mould (Botrytis) (PER88559)	
BLAD	**BM01**	Blossom blight	
		Brown rot	
Captan	**M4**	Blossom blight	
		Brown rot	
Chlorothalonil	**M5**	Blossom blight	APVMA: Previously nominated for review Canada: Review completed, continued use EU: No authorisation in place
		Brown rot	
		Freckle and scab	
		Rust	
		Shot hole	
		Transit rot	
Copper	**M1**	Bacterial canker/blast	EU: Candidates for substitution
		Bacterial spot	
		Blossom blight	
		Brown rot	
		Freckle and scab	
		Leaf curl	
		Rust	
		Shot hole	

Active Constituents	Chemical Group	Problem	Comment
Dithianon	**M9**	Brown rot	EU: Restricted use to non-edible crops
		Freckle and scab	
		Shot hole	
Fenhexamid (PER88787)	**17**	Grey mould (Botrytis)	
Fludioxonil (Po)	**12**	Brown rot	EU: Under review & candidate for substitution
		Grey mould (Botrytis)	
		Transit rot	
Fluopyram + trifloxystrobin	**7 + 11**	Blossom blight	
		Brown rot	
		Shot hole	
Fluxapyroxad + pyraclostrobin	**7 + 11**	Blossom blight	
Iprodione	**2**	Blossom blight	Canada: Majority of food crop uses deleted Codex: Review scheduled EU: No authorisation in place
		Brown rot	
		Transit rot	
Mancozeb	**M3**	Blossom blight	APVMA: Nominated for review Canada: Many uses cancelled Codex: To be reviewed 2023/24 EU: Authorisation not renewed
		Brown rot	
		Freckle and scab	
		Rust	
		Shot hole	
Mandestrobin	**11**	Blossom blight	
		Brown rot	
Metiram	**M3**	Rust	APVMA: Nominated for review Canada: Proposed cancelling of foliar uses other than potato Codex: To be reviewed 2023/24 EU: Under review
		Shot hole	

Active Constituents	Chemical Group	Problem	Comment
Penthiopyrad	**7**	Blossom blight	
		Brown rot	
		Freckle and scab	
Procymidone	**2**	Blossom blight	APVMA: Review in progress Codex: No MRLs EU: No authorisations
Propiconazole	**3**	Blossom blight	APVMA: Nominated for review EU: No authorisations
		Brown rot	
Sulfur	**M2**	Freckle and scab	
		Rust	
		Blossom blight	
Tebuconazole	**3**	Silverleaf	APVMA: Nominated for review EU: Candidate for substitution
Thiram	**M3**	Brown rot	APVMA: Nominated for review Canada: Cancelled all foliar uses (2021) Codex: To be reviewed 2023/24 EU: No authorisation in place USA: Proposing to cancel all foliar uses
		Freckle and scab	
		Shot hole	
Triforine	**3**	Brown rot	APVMA: Nominated for review Canada: Review completed 2019 – use acceptable EU: No authorisation
Ziram	**M3**	Blossom blight	APVMA: Nominated for review Canada: Cancelling of all uses Codex: To be reviewed 2023/24 EU: Candidate for substitution USA: Proposing to cancel all uses
		Brown rot	
		Freckle and scab	
		Leaf curl	
		Shot hole	

Problem	Active Constituents	Chemical Group	Comment
WEEDS			
Broadleaf weeds and grasses	2,2-DPA	**0**	EU: No authorisations in place
	2,4-D	**4**	
	Carfentrazone-ethyl	**14**	
	Diquat	**22**	APVMA: Currently under review EU: No authorisation in place
	Fluazifop-P	**1**	
	Flumioxazin	**14**	EU: Candidate for substitution
	Glufosinate-ammonium	**9**	EU: No authorisation in place
	Glyphosate	**10**	Ongoing issues internationally
	Haloxyfop-P	**1**	EU: No authorisation
	Isoxaben	**29**	
	Napropamide	**0**	
	Norflurazon	**12**	EU: No authorisation
	Oryzalin	**3**	EU: No authorisation
	Oxyfluorfen	**14**	EU: Candidate for substitution
	Paraquat	**22**	APVMA: Currently under review EU: No authorisation in place Rotterdam Convention - nomination
	6-benzyladenine		
	AVG as HCl salt		
	Ethephon		
	Fatty acid esters-canola		
	Gibberellic acid		
	Paclobutrazol		
	Prohexadione-calcium		

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