Table Grape

Strategic Agrichemical Review Process
(SARP)

February 2023

Hort Innovation
Project – MT21005

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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 table grape industry across Australia. The information in this report will assist the industry with its agrichemical selection and usage into the future.

Date of report:
February 2023

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Hort Innovation Strategic levy investment | TABLE GRAPE FUND

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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 table grape 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

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

Common Name	Scientific Name
Downy Mildew	*Plasmopara viticola*
Grey Mould / Botrytis Bunch Rot	*Botrytis cinerea*
Powdery Mildew	*Erysiphe necator*, *Uncinula necator*, *Oidium* spp.
Sour Rot	Complex that can include yeasts, *Aspergillus*, *Pencillium*, *Botrytis*, *Rhizopus*

1.2 Insects and mites

The high priority insect and mite pests are:

Common Name	Scientific Name
Long-Tailed Mealybug	*Pseudococcus longispinus*
Queensland Fruit Fly	*Bactrocera tryoni*
Mediterranean Fruit Fly	*Ceratitis capitata*
Two Spotted Mite	*Tetranychus urticae*
Bunch Mite	*Brevipalpus californicus*

1.3 Weeds

The high priority weeds identified are:

Common name	Scientific name
Flaxleaf Fleabane	*Conyza bonariensis*

1.4 Plant Growth Regulators

The high priority Plant Growth Regulator issues are:

Issue
Extend Shelf Life
Advancement of Maturity
Fruit Thinning

2. The Australian Table Grape Industry

Table Grapes are a major fruit that are grown across all states of Australia, with Victoria being the major producing state.

Total production for the year ending June 2021 was 198,389 tonnes[1]. Wholesale value of fresh supply was $326 m, with $311 m distributed into retail and $15.5 m into food service.

Menindee and Thompson are the two most common green varieties in Australia, accounting for 38% of production for the year ending June 2020. Crimson, Flame and Globe are the main red varieties, and they account for 30% of fresh production.

Fresh Table Grape Seasonality by State

State	20/21 t	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
New South Wales	19,839												
Victoria	154,743												
Queensland	9,919												
Western Australia	4,980												
South Australia	7,936												
Northern Territory	972												
Imported	12,033												
Availability legend			High			Medium			Low			None	

Australia is a net exporter of fresh table grapes, with 61% of total production exported in 2020/21. China is our largest import destination, accounting for 35% of total exports for the year ending June 2021. Other major importing companies are Indonesia, Hong Kong, Japan and Philippines.

[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 table grape 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 table grape 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 table grape 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 table grape 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 table grape 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 table grapes as a major crop. Table Grapes fit within the APVMA crop group 004: Berries and other small fruits, Subgroup 004D, Small fruit vine climbing. 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 table grape 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 Table Grape Strategic Agrichemical Review Process (SARP), which was last updated in 2017, 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 table grape
Appendix 2. Products available for control of insects and mites in table grape
Appendix 3. Products available for weed control in table grape
Appendix 4. Plant growth regulators available in table grape
Appendix 5. Current permits for use in table grape
Appendix 6. Table Grape Maximum Residue Limits (MRLs)
Appendix 7. Table Grape Agrichemical Regulatory Risk Assessment

4. Diseases, Pests and Weeds of Table Grape

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 table grape

4.1.1 Disease priorities

Common name	Scientific name
Moderate	
Downy Mildew	*Plasmopara viticola*
Grey Mould / Botrytis Bunch Rot	*Botrytis cinerea*
Powdery Mildew	*Erysiphe necator*, *Uncinula necator*, *Oidium* spp.
Sour Rot	Complex that can include yeasts, *Aspergillus*, *Pencillium*, *Botrytis*, *Rhizopus*
Low	
Black Spot / Anthracnose	*Elsinoe ampelina*
Phomopsis / Cane & Leaf Spot	*Phomopsis viticola*
Eutypa Dieback	*Eutypa lata*

There were no high priority diseases identified based on the feedback received, but the following were rated as moderate priority: Downy Mildew, Grey Mould / Botrytis Bunch Rot, Powdery Mildew and Sour Rot. 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 planting stock, 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 particular 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. Croplife has resistance management strategies in place for grapevines[4] relating to the management of Downy Mildew, Grey Mould and Powdery Mildew.

[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
Downy Mildew (*Plasmopara viticola*) **Priority: Moderate**							
Rated as a high priority in QLD and SA, and as a moderate priority in VIC and WA. Downy Mildew infection is favoured by high humidity, and it can impact on leaves, shoots, flowers and fruit. Vineyard hygiene and canopy management should be used in conjunction with a well-planned fungicide program.							
Amisulbrom + Tribasic Copper Sulphate (Amicus Blue) Nufarm	21+M1	Protectant	28	A	ALL	Registered in grapevines for control of **Downy Mildew**. Maximum of 4 applications per season, with no more than 2 consecutive applications. Use a retreatment interval of 7-10 days.	-
Azoxystrobin (Amistar)	11	Protectant & Curative	14	A	ALL	Registered in grapes for control of Powdery Mildew, **Downy Mildew** and Botrytis Bunch Rot. Apply 2 or 3 consecutive applications at 10-16 day intervals. Do not use more than 3 applications per season.	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative	28	A	ALL	Registered in grapevines for control of Powdery Mildew, **Downy Mildew** and Botrytis Bunch Rot. Maximum of 2 applications per season, with a retreatment interval of 7-21 days.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Captan	M4	Protectant	7 G:7	A	ALL	Registered in grapes for control of Black Spot, Grey Mould, **Downy Mildew** and Phomopsis Cane and Leaf Blight. Apply from flowering onwards, at intervals of 10-14 days. Maximum number of applications not specified.	R3
Chlorothalonil (Bravo) Syngenta	M5	Protectant	7 NG	A	ALL	Registered in grapes for control of **Downy Mildew** and Botrytis Bunch Rot. Apply at 7-14 day intervals particularly during wet weather and periods of rapid growth. Maximum number of applications not specified.	R3
Copper	M1	Protectant	1	A	ALL	Registered in grapes for control of **Downy Mildew**. Apply when shoots are 10cm long and repeat at 10-14 day intervals. Maximum number of applications not specified.	-
Dimethomorph (Acrobat)	40	Protectant	28	A	ALL	Registered in grapevines for control of **Downy Mildew**. Maximum of 6 applications per season, with a retreatment interval of 7-14 days.	-
Dimethomorph + Amectotradin (Zampro) AgNova	40+45	Protectant	28	A	ALL	Registered in grapevines for control of **Downy Mildew**. Maximum of 4 applications per season, with no more than 2 consecutive applications and a retreatment interval of 7-14 days.	-
Dimethomorph + Azoxystrobin (Dimazoxy)	40+11	Protectant & Curative	28	A	ALL	Registered in grapevines for control of **Downy Mildew**. Maximum of 3 consecutive sprays, with a 7-14 day retreatment interval.	-
Dimethomorph + Mancozeb (Acrobat WDG) BASF	40+M3	Protectant	28	A	ALL	Registered in grapevines for control of **Downy Mildew**. Maximum of 6 applications per season, with a retreatment interval of 7-14 days.	R2
Dithianon	M9	Protectant	21	A	ALL	Registered in grapes for control of **Downy Mildew**, Black Spot and Phomopsis Cane & Leaf Spot. Apply when shoots are 10cm long and continue applications at 10 day intervals in wet weather, decreasing to 21 days in dry weather. To protect bunches, apply during flowering and 2 weeks later, then every 10-21 days as above. Maximum number of applications not specified.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Fluoxapiprolin (Xivana Prime) Bayer	49	Protectant	NR NG	A	ALL	Registered in grapevines for control of **Downy Mildew**. Start applications from 10cm shoots onwards. Repeat the application 10-21 days later. Do not use more than 2 applications pre season.	-
Hydrogen Peroxide + Peroxy Acetic Acid (Peratec Plus)	M	Protectant	1	A	ALL	Registered in grapes for control of Grey Mould / Bunch Rot, **Downy Mildew** and Powdery Mildew. Apply at first sign of disease and repeat as necessary. Maximum number of applications not specified.	-
Mancozeb	M3	Protectant	14	A	QLD, NSW, VIC, SA & TAS	Registered in grapes for control of **Downy Mildew**. Do not apply after flowering has commenced. Begin application at 10-15cm stage of shoot growth. Continue a programme of application every 10-14 days until the risk of infection diminishes. Maximum number of applications not specified.	R2
Mancozeb + Tribasic Copper Sulphate	M3+M1	Protectant	14	A	ALL	Registered in grapevines for control of **Downy Mildew**. Begin application at 10-15cm stage of shoot growth. Continue a programme of application every 10-14 days until the risk of infection diminishes. Maximum number of applications not specified.	R2
Mandipropamid (Revus) Syngenta	40	Protectant	NR NG	A	ALL	Registered in grapes for control of **Downy Mildew**. Do not apply later than the end of flowering. Do not use more than 3 applications per season, and no more than 2 consecutive. Use 10-21 day intervals from before the first sign of infection.	-
Mandipropamid + Mancozeb (Revus MZ) Syngenta	40+M3	Protectant	NR NG	A	ALL	Registered in grapes for control of **Downy Mildew**. Do not apply later than the end of flowering. Use 10-21 day intervals from before the first sign of infection. Do not apply more than 3 applications per season.	R2
Mancozeb + Metalaxyl-M (Ridomil Gold MZ) Syngenta	M3+4	Protectant	14	A	ALL (excl. VIC)	Registered in grapevines for control of **Downy Mildew**. Maximum of 4 applications per season, with no more than 2 consecutive applications. Retreatment interval not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Metiram (Polyram)	M3	Protectant	14	A	ALL	Registered in grapevines for control of Black Spot, **Downy Mildew** and Phomopsis Cane & Leaf Blight. Apply at bud burst as first spray only if carryover expected, then 2 weeks after bud burst or as disease pressure requires. Maximum number of applications not specified.	R2
Phosphorous Acid	P07 (33)	Protectant & Curative	NR	A	ALL	Registered in grapes for control of **Downy Mildew**. Apply at times of high disease risk. Maximum number of applications and retreatment interval not specified.	-
Propineb + Oxadixyl (Rebound) Kiwi Rural Trading	M3+4	Protectant	3	A	ALL	Registered in grapevines for control of **Downy Mildew**. Maximum of 4 applications per season, with no more than 2 consecutive applications, and a retreatment interval of 7-21 days.	R2
Pyraclostrobin (Cabrio)	11	Protectant & Curative	21	A	ALL	Registered in grapevines for control of **Downy Mildew** and Powdery Mildew. Commence applications at flowering. Maximum of 3 applications per season, with a retreatment interval of 10-14 days.	-
Trifloxystrobin (Flint)	11	Protectant & Curative	35	A	ALL	Registered in grapevines for control of Powdery Mildew and suppression of **Downy Mildew**. Critical crop timing is from early flowering to pre bunch closure. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	-
Zineb	M3	Protectant	7	A	ALL	Registered in grapevines for control of **Downy Mildew**. Apply at 10 day intervals in moist, humid weather or as required. Maximum number of applications not specified.	R2
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Protectant	NR	P-A	ALL	Registered in grapes for control of Grey Mould and Powdery Mildew. US registration for control of **Downy Mildew** in ornamentals.	-
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. US registration for control of **Downy Mildew** in Brassica leafy vegetables, cucurbits, leafy vegetables, spinach, and suppression of **Downy Mildew** in bulb onion.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Azoxystrobin + Oxathiapiprolin (Orondis Flexi) Syngenta	11+49	Protectant & Curative		P		Registered for control of **Downy Mildew** in brassica vegetables, bulb vegetables, cucurbits, endive, leafy vegetables, lettuce, onion and poppy.	-
Cyazofamid (Ranman) ISK/UPL	21	Protectant & Curative		P		Registered for control of Late Blight in potatoes and White Blister in broccoli, **Downy Mildew** in Brassica seedlings and Brassica leafy seedlings.	-
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered for control of Shot Hole, Blossom Blight, Leaf Rust, Alternaria, Anthracnose and Scab in almonds, Blossom Blight in cherries and Husk Spot in macadamias. US registration for suppression of **Downy Mildew** in bulb vegetables, cucurbits and leafy vegetables.	-
Oxathiapiprolin + Mancozeb (Zorvec Enibel) Corteva	49+M3	Protectant		P		Submitted for registration in June 2021 for control of various diseases including **Downy Mildew** in vegetables and poppies.	R2
Propamocarb Hydrochloride + Fluopicolide (Infinito) Bayer	28+43	Protectant		P		Registered for the control of **Downy Mildew** in brassica vegetables, bulb vegetables, cucumber, cucurbits, leafy vegetables, lettuce, poppy and potatoes.	-
Grey Mould / Botrytis Bunch Rot (*Botrytis cinerea*) **Priority: Moderate**							
Rated as a high priority in QLD and SA, and as a moderate priority in VIC and WA. Botrytis is the most damaging type of bunch rot in vines. Infection can occur at flowering although symptoms may not be obvious until close to harvest. Vineyard hygiene and canopy management should be used in conjunction with a well-planned fungicide program.							
Aureobasidium pullalans (Botector) Nufarm	BM02	Biological	NR	A	ALL	Registered in grapes for control of **Botrytis Bunch Rot** / **Grey Mould**. Ensure maximum coverage of flowers/bunches between growth stages EL 19-37 (BBCH 60-88). Maximum of 4 applications per season. Retreatment interval not specified.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Azoxystrobin (Amistar)	11	Protectant & Curative	14	A	ALL	Registered in grapes for control of Powdery Mildew, Downy Mildew and **Botrytis Bunch Rot**. Apply 2 or 3 consecutive applications at 10-16 day intervals. Do not use more than 3 applications per season.	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative	28	A	ALL	Registered in grapevines for control of Powdery Mildew, Downy Mildew and **Botrytis Bunch Rot**. Maximum of 2 applications per season, with a retreatment interval of 7-21 days.	R3
Bacillus amyloliquefaciens strain QST713 (Serenade Opti) Bayer	BM 02	Biological	NR	A	ALL	Registered in grapevines for control of **Botrytis**. Number of applications and retreatment interval not specified.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	A	ALL	Registered in grapes for control of **Botrytis Bunch Rot**. Use preventatively at 3-14 day intervals prior to an infection period. Maximum number of applications not specified.	-
Boscalid (Filan)	7	Protectant	28 NG	A	ALL	Registered in grapes for control of **Botrytis Bunch Rot**. Ideal timing for first application is 5% capfall. Applications can also be made at 80% capfall, pre-bunch closure, veraison or 4 weeks prior to harvest. Use only 1 application as part of a 3 spray program, or 2 applications in a 4 spray program. Do not make consecutive applications.	-
Captan	M4	Protectant	7 G:7	A	ALL	Registered in grapes for control of Black Spot, **Grey Mould**, Downy Mildew and Phomopsis Cane and Leaf Blight. Apply from flowering onwards, at intervals of 10-14 days. Maximum number of applications not specified.	R3
Chlorothalonil (Bravo) Syngenta	M5	Protectant	7 NG	A	ALL	Registered in grapes for control of Downy Mildew and **Botrytis Bunch Rot**. Apply at 7-14 day intervals particularly during wet weather and periods of rapid growth. Maximum number of applications not specified.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Cyprodinil (Solaris)	9	Protectant	28	A	ALL	Registered in grapes (except grapes grown for dried fruit production) for control of **Grey Mould** / **Bunch Rot**. Applications can be made at 5% capfall, 80% capfall, pre-bunch closure or veraison. Maximum of 2 applications per season. Retreatment interval not specified.	-
Eugenol + Geraniol + Thymol (Novellus)	BM01	Biological	7	A	ALL	Registered in grapes for control of **Grey Mould** / **Botrytis Bunch Rot**. Apply between capfall and 7 days prior to harvest. Maximum of 4 applications per season with a minimum retreatment interval of 7 days.	-
Fenhexamid (Teldor) Bayer	13	Protectant	21 G:14	A	ALL	Registered in grapes for control of **Botrytis Bunch Rot**. Use only 1 application as part of a 3 spray program, or 2 applications in a 4 spray program. Retreatment interval not specified.	-
Fenpyrazamine (Prolectus) Sumitomo	17	Protectant	7 G:2	A	ALL	Registered in table grapes for control of **Grey Mould**. Apply between 10% flowering and up to just prior to harvest. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	-
Fludioxonil + Cyprodinil (Switch) Syngenta	12+9	Protectant	28	A	ALL	Registered in grapes (except grapes grown for dried fruit production) for control of **Grey Mould**. Applications can be made at 5% capfall, 80% capfall, pre-bunch closure or veraison. Maximum of 2 applications per season. Retreatment interval not specified.	R3
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	NR NG	A	ALL	Registered in grapevines for control of Powdery Mildew and **Botrytis Bunch Rot**. Critical flowering application timing includes but is not limited to 10% and 80% capfall. Do not apply after berries reach pepper-corn size. Maximum of 2 treatments per season. Retreatment interval not specified.	R3
Hydrogen Peroxide + Peroxy Acetic Acid (Peratec Plus)	M	Protectant	1	A	ALL	Registered in grapes for control of **Grey Mould** / **Bunch Rot**, Downy Mildew and Powdery Mildew. Apply at first sign of disease and repeat as necessary. Maximum number of applications not specified.	-
Iprodione (Rovral)	2	Protectant & Curative	7	A	ALL	Registered in grapes for control of **Grey Mould**. Maximum of 2 applications per season. Retreatment interval not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Protectant	NR	A	ALL	Registered in grapes for control of **Grey Mould** and Powdery Mildew. Maximum of 4 applications per season, with a retreatment interval of 10-14 days. Retreatment interval of 7 days is recommended if rainfall occurs between treatments.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative	14 NG	A	ALL	Registered in grapes for control of **Botrytis Bunch Rot** / **Grey Mould** and Powdery Mildew. Critical timings are 5% capfall, 80% capfall, pre-bunch closure and veraison. Maximum of 1 application per season.	R3
Pyrimethanil (Scala)	9	Protectant & Curative	7	A	ALL	Registered in grapevines for control of **Botrytis Grey Mould**. Number of applications and retreatment interval not specified.	-
Sodium Metabisulphite	M	Protectant / Post-Harvest	NR	A	ALL	Registered in grapes (packaged) as a post-harvest control of **Botrytis**. Use in cartons of packaged grapes as per label instructions to maintain grape quality for 8-12 weeks in cold storage.	-
BLAD (ProBlad Plus)	BM 01	Biological	NR	P		Registered for control of Brown Rot and Blossom Blight in stone fruit. US registration for control of ***Botrytis*** in fruiting vegetables, grapes, strawberries and ornamentals.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		Registered for control of Septoria in wheat. New active from Corteva with activity on Septoria, Powdery Mildew, **Botrytis**, Anthracnose, Alternaria, Scab, Monilinia, Rust and *Mycosphaerella* spp.	-
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of **Botrytis** in almonds and stone fruit. US registration for control of **Botrytis** in almond, artichoke, berries, brassica vegetables, brassica leafy greens, cherries, dill seed, pome fruit, small vine climbing fruit (except fuzzy kiwifruit), ginseng, herbs, hops. leafy greens, melons, pistachio, tomato, pepper and root vegetables.	-
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered for control of Shot Hole, Blossom Blight, Leaf Rust, Alternaria, Anthracnose and Scab in almonds, Blossom Blight in cherries and Husk Spot in macadamias. US registration for control ***Botrytis* spp.** in bulb vegetables, leafy vegetables, pome fruit, stone fruit, strawberries and tree nuts.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Isofetamid (Kenja) ISK / AgNova	7	Protectant		P		Registered for control of ***Botrytis*** in berries***.***	-
Powdery Mildew (*Erysiphe necator*, *Uncinula necator*, *Oidium* spp.) **Priority: Moderate**							
Rated as a high priority in QLD, SA and WA, and as a moderate priority in VIC. Powdery Mildew infections are common and widespread in grapevines. It is favoured by mild, cloudy weather and low to moderate light (sheltered parts of the canopy). Canopy management practices that permit good air circulation, spray penetration and filtered sunlight exposure are highly beneficial. A planned, preventative fungicide program will be required to manage the disease in most regions.							
Azoxystrobin (Amistar)	11	Protectant & Curative	14	A	ALL	Registered in grapes for control of **Powdery Mildew**, Downy Mildew and Botrytis Bunch Rot. Apply 2 or 3 consecutive applications at 10-16 day intervals. Do not use more than 3 applications per season.	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative	28	A	ALL	Registered in grapevines for control of **Powdery Mildew**, Downy Mildew and Botrytis Bunch Rot. Maximum of 2 applications per season, with a retreatment interval of 7-21 days.	R3
Cyflufenamid (Flute) AgNova	U6	Protectant & Curative	35	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Apply 1 or 2 applications from E-L 18 (Caps changing colour) to E-L 31 (berries pea-size), with a retreatment interval of 10-14 days.	-
Difenoconazole (Digger) Nufarm	3	Protectant & Curative	28 G:2	A	ALL	Registered in grapes for control of **Powdery Mildew**. Maximum of 3 applications per season, with no more than 2 consecutive. Do not exceed spray intervals of 21 days.	R3
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	NR NG	A	ALL	Registered in grapevines for control of **Powdery Mildew** and Botrytis Bunch Rot. Apply from 4 leaves separated onwards. Do not apply after berries reach pepper-corn size. Maximum of 2 treatments per season, with a retreatment interval of 10-14 days.	R3
Hydrogen Peroxide + Peroxy Acetic Acid (Peratec Plus)	M	Protectant	1	A	ALL	Registered in grapes for control of Grey Mould / Bunch Rot, Downy Mildew and **Powdery Mildew**. Apply at first sign of disease and repeat as necessary. Maximum number of applications not specified.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	7 NG	A	ALL	Registered in grapes for control of **Powdery Mildew**. Maximum of 3 applications per season, with a retreatment interval of 7-21 days.	-
Metrafenone (Vivando) BASF	U8	Protectant	35	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Maximum of 4 applications per season, with no more than 2 consecutive applications. Retreatment interval 7-10 days.	-
Myclobutanil (Myclonil)	3	Protectant & Curative	14	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Apply when shoots are 10-20 cm long and then at 14-21 day intervals. Maximum of 3 applications per season.	R3
Penconazole (Topas)	3	Protectant & Curative	14	A	ALL	Registered in grapes for control of **Powdery Mildew**. Commence applications when shoots are approximately 20cm long. Maximum of 3 applications with a 14-21 day retreatment interval.	R3
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Protectant	NR	A	ALL	Registered in grapes for control of Grey Mould and **Powdery Mildew**. Maximum of 4 applications per season, with a retreatment interval of 10-14 days. Retreatment interval of 7 days is recommended if rainfall occurs between treatments.	-
Potassium Bicarbonate (EcoCarb)	M2	Protectant	NR	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Begin applications at first sign of disease. Maximum number of applications not specified and use a retreatment interval of 10-14 days. Do not apply to late season black or red table grapes close to harvest.	-
Pydiflumetofen (Miravis Adepidyn) Syngenta	7	Protectant & Curative	NR	A	ALL	Registered in grapes for control of **Powdery Mildew**. Apply up until time that berries are a pea size (7mm). Maximum of 3 applications per season, with a retreatment interval of 14-21 days.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative	14 NG	A	ALL	Registered in grapes for control of Botrytis Bunch Rot / Grey Mould and **Powdery Mildew**. Critical timings are 5% capfall, 80% capfall, pre-bunch closure and veraison. Maximum of 1 application per season.	R3
Pyraclostrobin (Cabrio)	11	Protectant & Curative	21	A	ALL	Registered in grapevines for control of Downy Mildew and **Powdery Mildew**. Commence applications at flowering. Maximum of 3 applications per season, with a retreatment interval of 10-14 days.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Pyriofenone (Kusabi) AgNova	50	Protectant & Curative	35 NG	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Maximum of 2 applications per season, with a retreatment interval of 7-10 days.	-
Petroleum Oil	-	Protectant	NR	A	ALL	Registered in grapes for control of **Powdery Mildew**. Commence applications just after woolly bud stage. Follow up sprays should be applied every 14-21 days until bunch closure. Maximum number of applications not specified.	-
Proquinazid (Talendo) Corteva	13	Protectant	28	A	ALL	Registered in grapes for control of **Powdery Mildew**. Maximum of 3 applications per season, with no more than 2 consecutive. Minimum retreatment interval of 14 days.	-
Quinoxyfen (Legend)	13	Protectant	14	A	ALL	Registered in grapes for control of **Powdery Mildew**. Maximum of 3 applications per season, using a retreatment interval of 7-14 days.	R3
Spiroxamine (Prosper)	5	Protectant & Curative	28	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Maximum of 3 applications per season, with no more than 2 consecutive applications, and a minimum retreatment interval of 21 days.	-
Sulfur	M2	Protectant	NR		ALL (excl. QLD)	Registered in grapevines for control of **Powdery Mildew**. Commence application at 2 weeks after budburst with further sprays applied at 4 and 6-7 weeks after budburst. Maximum number of applications not specified.	-
Tea Tree Oil (Timorex Gold)	-	Protectant	NR	A	ALL	Registered in grapes for control of **Powdery Mildew**. Apply for disease prevention at first sign of disease and then continue at 7 day intervals. Maximum number of applications not specified.	-
Tebuconazole	3	Protectant & Curative	56	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Apply at the following stages: 1. When shoots are 10cm long 2. Immediately before flowering 3. Mid flowering 4. After fruit set 5. Prior to bunch close. Retreatment intervals not specified.	R3
Tetraconazole	3	Protectant & Curative	14 G:28	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Apply at the following stages: 1. When shoots are 10cm long 2. Immediately before flowering 3. Mid flowering 4. After fruit set 5. Prior to bunch close. Minimum retreatment interval of 21 days.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Triadimefon (Bayfidan)	3	Protectant & Curative	14	A	NSW, VIC & WA	Registered in grapevines for control of **Powdery Mildew**. Apply at the following stages: 1. When shoots are 10cm long 2. Immediately before flowering 3. Mid flowering 4. After fruit set 5. Prior to bunch close. Retreatment intervals not specified.	R3
Triadimenol (Bayfidan)	3	Protectant & Curative	7	A	ALL	Registered in grapevines for control of **Powdery Mildew**. Apply at the following stages: 1. When shoots are 10cm long 2. Immediately before flowering 3. Mid flowering 4. After fruit set 5. Prior to bunch close. Minimum retreatment interval of 21 days.	R3
Trifloxystrobin (Flint)	11	Protectant & Curative	35	A	ALL	Registered in grapevines for control of **Powdery Mildew** and suppression of Downy Mildew. Critical crop timing is from early flowering to pre bunch closure. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	-
Bacillus amyloliquefaciens strain QST713 (Serenade Opti) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in grapevines for control of Botrytis. US registration for control of **Powdery Mildew** in cucurbits, grapes, pome fruit, stone fruit and strawberries.	-
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		Registered in tomatoes for the suppression of Bacterial Speck, Bacterial Spot, Bacterial Canker and **Powdery Mildew**. US registration for control of **Powdery Mildew** in cucurbits.	-
BLAD (Problad Plus)	BM 01	Biological	NR	P		Registered for control of Brown Rot and Blossom Blight in stone fruit. US registration for control of **Powdery Mildew** in cucurbits, fruiting vegetables, grapes, hops, pome fruit and strawberries.	-
Boscalid + Kresoxim-Methyl (Colliss) BASF	7+11	Protectant & Curative		P		Registered for control of **Powdery Mildew** in cucurbits.	-
Bupirimate (Nimrod) Adama	8	Protectant & Curative		P		Registered for control of **Powdery Mildew** in apples, cucurbits, cut flower, eggplant, melons, nursery stock, ornamentals, peppers and strawberries.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		Registered for control of Septoria in wheat. New active from Corteva with activity on Septoria, **Powdery Mildew**, Botrytis, Anthracnose, Alternaria, Scab, Monilinia, Rust and *Mycosphaerella* spp.	-
Streptomyces lydicus WYEC108 (Actinovate) Novozymes Bioag	BM 02	Biological	NR	P		Registered for suppression of **Powdery Mildew** in cucurbits**.**	-
Sour Rot (complex that can include yeasts, *Aspergillus*, *Pencillium*, *Botrytis*, *Rhizopus*) **Priority: Moderate**							
Rated as a high priority in QLD, a moderate priority in SA and VIC, and as a low priority in WA. The most obvious sign of Sour Rot is the distinctive vinegar smell and the appearance of watery berries with thin skins. Sour Rot is associated with insects such as Vinegar Fly, which cause entry points for infection by damaging fruit and can also vector the infections throughout the vineyard. Vineyard hygiene and good canopy management are useful cultural controls.							
Bacillus amyloliquefaciens strain QST713 (Serenade Opti) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in grapevines for control of Botrytis. Likely activity on bacterial pathogens associated with Sour Rot.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P-A	ALL	Registered in grapes for control of Botrytis Bunch Rot. Likely activity on bacterial pathogens associated with Sour Rot.	-
Copper	M1	Protectant	1	P-A	ALL	Registered in grapes for control of Downy Mildew. Likely activity on bacterial pathogens associated with Sour Rot.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Black Spot / Anthracnose (*Elsinoe ampelina*) **Priority: Low**							
Rated as a moderate priority in SA, and as a low priority in QLD, VIC and WA. Black Spot can attack all green parts of the vine, with young, succulent vine tissues being particularly susceptible to infection. Cool, wet weather during spring and early summer favours outbreaks as surface moisture is essential for the spread of fungal spores and infection. Critical times for fungicide application are at 2 weeks and 3-4 weeks after bud burst. Additional applications may be necessary if conditions favourable for infection persist.							
Captan	M4	Protectant	7 G:7	A	ALL	Registered in grapes for control of **Black Spot**, Grey Mould, Downy Mildew and Phomopsis Cane and Leaf Blight. Apply from flowering onwards, at intervals of 10-14 days. Maximum number of applications not specified.	R3
Dithianon	M9	Protectant	21	A	ALL	Registered in grapes for control of Downy Mildew, **Black Spot** and Phomopsis Cane & Leaf Spot. Apply when shoots are 10cm long and continue applications at 10 day intervals in wet weather, decreasing to 21 days in dry weather. To protect bunches, apply during flowering and 2 weeks later, then every 10-21 days as above. Maximum number of applications not specified.	R3
Mancozeb	M3	Protectant	14	A	ALL	Registered in grapes for control of **Black Spot**. Do not apply after flowering has commenced. Begin application at 10-15cm stage of shoot growth. Continue a programme of application every 10-14 days until the risk of infection diminishes. Maximum number of applications not specified.	R2
Metiram (Polyram)	M3	Protectant	14	A	ALL	Registered in grapevines for control of **Black Spot**, Downy Mildew and Phomopsis Cane & Leaf Blight. Apply at bud burst as first spray only if carryover expected, then 2 weeks after bud burst or as disease pressure requires. Maximum number of applications not specified.	R2
Thiram	M3	Protectant	7	A	ALL	Registered in grapes for control of **Black Spot** / **Anthracnose**. Apply at bud swell, at bud burst and when shoots are 15-20 cm long. Repeat every 14 days if weather conditions favour disease development. Maximum number of treatments not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Ziram	M3	Protectant	7	A	ALL	Registered in grapes for control of **Black Spot**. Apply at bud swell, bud burst and 2-3 weeks later. If bad weather persists, apply at 10-14 day intervals. Maximum number of treatments not specified.	R2
Aureobasidium pullalans (Botector) Nufarm	BM02	Biological	NR	P-A	ALL	Registered in grapes for control of Botrytis Bunch Rot / Grey Mould. Registered for suppression of **Anthracnose** in berries. US registration for control of **Anthracnose** in berries, stone fruit, almonds, fruiting vegetables, cucurbits, leafy vegetables, ornamentals and hops.	-
Azoxystrobin (Amistar)	11	Protectant & Curative	14	P-A	ALL	Registered in grapes for control of Powdery Mildew, Downy Mildew and Botrytis Bunch Rot. Registered for control of **Anthracnose** in avocados and mangos.	-
Bacillus amyloliquefaciens strain QST713 (Serenade Opti) Bayer	BM 02	Biological	NR	P-A	ALL	Registered in grapevines for control of Botrytis. US registration for control of **Anthracnose** in berries, fruiting vegetables, herbs/spices, stone fruit, strawberries and tree nuts.	-
Copper	M1	Protectant	1	P-A	ALL	Registered in grapes for control of Downy Mildew. Registered for control of **Anthracnose** in avocado, macadamia, mango and lettuce.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	NR NG	P-A	ALL	Registered in grapevines for control of Powdery Mildew and Botrytis Bunch Rot. US registration for control of **Anthracnose** in almond, cucurbits and tree nuts.	R3
Mancozeb + Metalaxyl-M (Ridomil Gold MZ) Syngenta	M3+4	Protectant	14	P-A	ALL (excl. VIC)	Registered in grapevines for control of Downy Mildew. Registered for control of **Anthracnose** in cucurbits and lettuce.	R2
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative	14 NG	P-A	ALL	Registered in grapes for control of Botrytis Bunch Rot / Grey Mould and Powdery Mildew. US registration for control of **Anthracnose** in almond, bushberries, grape & small fruit vine climbing (except fuzzy kiwifruit), strawberries and specific tree nuts.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		Registered for control of Septoria in wheat. New active from Corteva with activity on Septoria, Powdery Mildew, Botrytis, **Anthracnose**, Alternaria, Scab, Monilinia, Rust and *Mycosphaerella* spp.	-
Isofetamid (Kenja) ISK / AgNova	7	Protectant		P		Registered for control of *Botrytis* in berries**.** US registration for control of **Anthracnose** in grapes and low growing berries.	-
Phomopsis / Cane & Leaf Spot (*Phomopsis viticola*) **Priority: Low**							
Rated as a moderate priority in SA, and as a low priority in QLD, VIC and WA. Phomopsis is favoured by extended periods of rainfall post budburst and can lead to yield losses of up to 30%. Yield loss can occur through reduction of viable canes, reduced budburst and bunch infection. Preventative fungicides should be used if a vineyard was infected in the previous season. Cultural controls including hygiene and canopy management will assist in reducing infections.							
Captan	M4	Protectant	7 G:7	A	ALL	Registered in grapes for control of Black Spot, Grey Mould, Downy Mildew and **Phomopsis Cane and Leaf Blight**. Apply from flowering onwards, at intervals of 10-14 days. Maximum number of applications not specified.	R3
Dithianon	M9	Protectant	21	A	ALL	Registered in grapes for control of Downy Mildew, Black Spot and **Phomopsis Cane & Leaf Spot**. Apply when shoots are 10cm long and continue applications at 10 day intervals in wet weather, decreasing to 21 days in dry weather. To protect bunches, apply during flowering and 2 weeks later, then every 10-21 days as above. Maximum number of applications not specified.	R3
Fluazinam (Shirlan)	29	Protectant	NR NG	A	ALL	Registered in grapevines for control of **Phomopsis Cane & Leaf Blight** and Eutypa Dieback. Apply 1 application at 1-4 weeks prior to budburst after pruning to dormant spurs and/or canes.	
Metiram (Polyram)	M3	Protectant	14	A	ALL	Registered in grapevines for control of Black Spot, Downy Mildew and **Phomopsis Cane & Leaf Blight**. Apply at bud burst and then repeat 7-10 days later. Maximum number of applications not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Aureobasidium pullalans (Botector) Nufarm	BM02	Biological	NR	P-A	ALL	Registered in grapes for control of Botrytis Bunch Rot / Grey Mould. Registered for suppression of **Phomopsis** in berries.	-
Copper	M1	Protectant	1	P-A	ALL	Registered in grapes for control of Downy Mildew. Registered for control of **Phomopsis** in olives.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	NR NG	P-A	ALL	Registered in grapevines for control of Powdery Mildew and Botrytis Bunch Rot. US registration for suppression of **Phomopsis** in grapes.	R3
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	7 NG	P-A	ALL	Registered in grapes for control of Powdery Mildew. US registration for control of **Phomopsis Cane & Leaf Spot** in table grapes.	-
Mancozeb + Metalaxyl-M (Ridomil Gold MZ) Syngenta	M3+4	Protectant	14	P-A	ALL (excl. VIC)	Registered in grapevines for control of Downy Mildew.	R2
Eutypa Dieback (*Eutypa lata*) **Priority: Low**							
Rated as a moderate priority in SA, and as a low priority in QLD, VIC and WA. Infections occur through spores entering exposed pruning wounds. Disease control can be achieved with preventative wound treatments and by removing infected wood and encouraging shoots from lower, uninfected parts of the vine.							
Fluazinam (Shirlan)	29	Protectant	NR NG	A	ALL	Registered in grapevines for control of Phomopsis Cane & Leaf Blight and **Eutypa Dieback**. Apply as a dormant treatment to vines within 24 hours of pruning.	
Iodocarb + Cyproconazole (Garrison Rapid Pruning Wound Dressing)	28+3	Protectant & Curative	NR	A	ALL (excl. WA)	Registered in grapevines for control of ***Eutypa lata***. Apply undiluted product thickly to dry wound surface with a paintbrush. Do not apply during the growing season. Apply on the same day that the pruning cut is made.	

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory Risk
Trichoderma harzianum (Vinevax)	-	Biological	NR	A	ALL	Registered in grapevines for control of **Eutypa Dieback Disease**. Apply as a spray or a brush-on paste to dry wounds immediately after pruning.	-

4.2 Insect and mite pests of table grape

4.2.1 Insect and mite pest priorities

Common name	Scientific name
High	
Long-Tailed Mealybug	*Pseudococcus longispinus*
Queensland Fruit Fly	*Bactrocera tryoni*
Mediterranean Fruit Fly	*Ceratitis capitata*
Two Spotted Mite	*Tetranychus urticae*
Bunch Mite	*Brevipalpus californicus*
Moderate	
Tuber or Obscure Mealybug	*Pseudococcus viburni*
Light Brown Apple Moth	*Epiphyas postvittana*
Western Flower Thrips	*Frankliniella occidentalis*
Plague Thrips	*Thrips imaginis*
Redback Spiders	*Latrodectus hasseltii*
Snails & Slugs	*Gastropoda* spp.
Low	
Onion Thrips	*Thrips tabaci*
Grapevine Hawk Moth	*Hippotion celerio*
Grapevine Moth	*Phalaenoides glycinae*
Pear & Cherry Slug	*Caliroa cerasi*
Fall Armyworm	*Spodoptera frugiperda*
Grapeleaf Rust Mite	*Calepitrimerus vitis*
Grapeleaf Blister / Bud Mite	*Colomerus vitis*
Broad Mite	*Polyphagotarsone-mus latus*
Citrus Flat Mite	*Brevipalpus lewisi*
European Red Mite	*Panonychus ulmi*
African Black Beetle	*Heteronychus arator*
Garden Weevil	*Phlyctinus callosus*
Apple Weevil / Curculio Beetle	*Otiorhynchus cribricollis*
Black Vine Weevil	*Otiorhynchus sulcatus*

Common name	Scientific name
Common Auger Beetle	*Xylopsocus gibbicolis*
Elephant Weevil	*Orthorhinus cylindrirostris*
Vine Weevil	*Orthorhinus klugi*
Phylloxera	*Daktulosphaira vitifolia*
Grapevine Scale	*Parthenolecanium persicae*
Inland Katydid	*Caedicia simplex*

The high priority insect pests identified by the survey were Long-Tailed Mealybug, Queensland Fruit Fly, Mediterranean Fruit Fly, Two Spotted Mite and Bunch Mite. 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 table grape 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 2022-23 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
Long-Tailed Mealybug (*Pseudococcus longispinus*) **Tuber or Obscure Mealybug** (*Pseudococcus viburni*) **Priority: High**								
Long-Tailed Mealybug is rated as a high priority in VIC and WA, and as a moderate priority in QLD and SA. Tuber Mealybug is rated as a high priority in SA, a moderate priority in QLD and VIC, and as a low priority in WA. Mealybugs are a widespread issue. They come in late season when the vines are bushy and are usually induced through use of broad-spectrum chemistry used for control of other pests. If you don't control ants, then you get problems with mealybug. The honeydew produced by mealybugs encourages Sooty Mould growth, which downgrades fruit quality and can impact on tree health in severe cases.								
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion	NR NG	A	ALL	Registered in grapevines for control of Grapevine Scale, **Long Tailed Mealybug** and Light Brown Apple Moth. Apply early in the season when crawlers are active and good coverage can be achieved. Maximum of 2 applications per season with a minimum retreatment interval of 21 days.	M Bee:M	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Buprofezin (Applaud) Corteva	16	Ingestion	56	A	ALL	Registered in grapes for control of **Longtail Mealybug** and **Tuber Mealybug** and for suppression of Grapevine Scale. Apply when monitoring indicates the first onset of crawler release. Apply a second application after a minimum retreatment interval of 14 days. Maximum of 2 applications per season.	L Bee:L	-
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	7 NG	A	ALL	Registered in table grapes for control of Queensland Fruit Fly, Mediterranean Fruit Fly and **Long Tailed Mealybug**. Can be applied as a soil application, either through micro-irrigation or band spraying between budburst and beginning of flowering. Foliar applications should be applied as soon as crawlers are seen. Maximum of 2 applications per season with a minimum retreatment interval of 21 days.	M Bee:VH	R2
Diazinon	1B	Contact	14	A	VIC, SA & WA	Registered in grapevines for control of **Mealybug**. Maximum number of applications and retreatment intervals not specified.	H Bee:H	R3
Ethyl Formate	-	Post-Harvest Fumigant	NR	A	ALL	Registered as a post-harvest treatment in table grapes for control of Light Brown Apple Moth, Redback Spiders, Two-Spotted Mites, **Long Tailed Mealybug**, Western Flower Thrips and Plague Thrips.	-	-
Malathion	1B	Contact	3	A	ALL (excl. QLD)	Registered in grapevines for control of Grapevine Scale, **Mealybug** and Grapevine Moth. Maximum number of applications and retreatment interval not specified.	H Bee:H	R3
Petroleum Oil	-	Contact	NR	A	ALL (excl. VIC)	Registered in grapes for control of **Mealybugs**. Maximum number of treatments and retreatment interval not specified.	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	28	A	ALL	Registered in grapes for control of **Longtailed Mealybug** and **Tuber Mealybug** and suppression of Grapevine Scale, Plague Thrips and Northern Plague Thrips. Commence applications after budburst at the onset of crawler emergence or when pest numbers reach economic threshold. Apply a second application 21-38 days after the first application if required. Maximum of 2 applications per season.	M Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	NR	A	ALL	Registered in table grapes for control of **Longtailed Mealybug**. Best control is achieved by making 2 applications at a retreatment interval of 14-21 days, when crawlers are active early in the season. Do not apply later than 80% capfall.	M Bee:H	R3
Flonicamid (Mainman) UPL	29	Ingestion		P		Registered for control of **Mealybug** in apples and pears.	M Bee:VL	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of various sucking pests in macadamias, avocados, mangoes, papaya, cucurbits, eggplant, peppers, tomatoes, green beans, potatoes and sweet potatoes. US registration for control of **Mealybug** in citrus and small fruit vine climbing (except Fuzzy Kiwifruit).	L Bee:L	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	-	-
Queensland Fruit Fly (*Bactrocera tryoni*) **Mediterranean Fruit Fly** (*Ceratitis capitata*) **Priority: High**								
Queensland Fruit Fly is rated as a high priority in QLD, SA and VIC, and as a low priority in WA. Mediterranean Fruit Fly is rated as a high priority in SA, VIC and WA. 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 + Malathion	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

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
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
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	7 NG	A	ALL	Registered in table grapes for control of **Queensland Fruit Fly**, **Mediterranean Fruit Fly** and Long Tailed Mealybug. Apply 3 consecutive foliar sprays 7 days apart when monitoring indicates fruit fly activity.	M Bee:VH	R2
Deltamethrin (Magmed) PER92548	3A	Contact	NR	A	WA	Permitted in grapes for use as a fruit fly trap for control of **Mediterranean Fruit Fly**.	VH Bee:H	-
Dimethoate PER13859	1B	Contact	NR	A	ALL	Permitted in non-bearing fruit fly host crops for control of **Fruit Fly**. Apply as a foliar and/or ground cover spray to both fallen and retained fruit after final harvest. Do not use more than 2 applications per season.	H Bee:H	R1
Malathion	1B	Contact	3	A	ALL (excl. VIC)	Registered in table grapes for control of **Queensland Fruit Fly** and **Mediterranean Fruit Fly.** Apply as a foliar spray. Maximum of 3 applications per season with at least 7-10 days between consecutive applications.	H Bee:H	R3
Spinosad (Naturalure) Corteva	5	Ingestion	NR	A	ALL	Registered in vine crops as a bait application for the control of **Queensland Fruit Fly** and **Mediterranean Fruit Fly**. Apply as a band or a spot spray every 7 days. Maximum number of applications not specified.	L Bee:L	-
Trichlorfon PER12439	1B	Contact	2 G:2	A	ALL (excl. VIC)	Permitted in table grapes for control of **Queensland Fruit Fly** and **Mediterranean Fruit Fly**. Apply as a cover spray when fruit flies are first seen and repeat as necessary. Maximum of 6 applications per season with a minimum retreatment interval of 7 days between consecutive applications.	H Bee:H	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion	NR NG	P-A	ALL	Registered in grapevines for control of Grapevine Scale, Long Tailed Mealybug and Light Brown Apple Moth. Registered for suppression of **Queensland Fruit Fly** and **Mediterranean Fruit Fly** in avocado, citrus and mangoes.	M Bee:M	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant (ST21001) to undertake studies to support a label registration for the control of **Fruit Fly** in stone fruit. 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.	L Bee:L	-
Tetraniliprole (Vayego) Bayer	28	Ingestion		P	ALL	Registered for control of **Mediterranean Fruit Fly** in stone fruit.	L-M Bee:VH	-
Two Spotted Mite (*Tetranychus urticae*) **Bunch Mite** (*Brevipalpus californicus*) **Priority: High**								
Two Spotted Mite is rated as a high priority in VIC, a moderate priority in QLD, and as a low priority in SA and WA. Bunch Mite is rated as a high priority in VIC, a moderate priority in QLD and SA, and as a low priority in WA. Two Spotted Mites cause leaf yellowing and in severe cases can cause leaf death. Early season damage by Bunch Mites is characterised by scarring around the base of the canes. Mites then move to the bunch stalks, berry pedicels and berries. Damage to the bunch stalks and pedicels can partially starve the berries, preventing sugar accumulation. Management options include reducing dust in the vineyard, promotion or introduction of predatory mites and judicious use of miticides while maintaining beneficial populations.								
Abamectin + Chlorantraniliprole (Voliam Targo) Syngenta	6+28	Ingestion	28 G:28	A	ALL	Registered in grapes for control of Light Brown Apple Moth, Grapevine Moth, **Two-Spotted Mite**, Grapeleaf Rust Mite and suppression of Garden Weevil. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	M Bee:H	-
Bifenazate (Acramite) PER14492	20D	Contact & Ingestion	14 G:28	A	ALL (excl. VIC)	Permitted in table grapes for control of **Two-Spotted Mite**. Maximum of 1 application per season.	L Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Cyflumetofen (Danisaraba) BASF	25A	Contact	14 NG	A	ALL	Registered in grapes for control of **Two-Spotted Mite**. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	L Bee:L	-
Ethyl Formate	-	Post-Harvest Fumigant	NR	A	ALL	Registered as a post-harvest treatment in table grapes for control of Light Brown Apple Moth, Redback Spiders, **Two-Spotted Mites**, Long Tailed Mealybug, Western Flower Thrips and Plague Thrips.	-	-
Etoxazole (Paramite)	10B	IGR / Contact	21 NG	A	ALL	Registered in table grapes for control of **Two-Spotted Mite**. Maximum of 1 application per season.	L Bee:VL	-
Fenbutatin Oxide (Torque) PER13378	12B	Contact	14	A	ALL (excl. VIC)	Permitted in table grapes for control of Rust Mite and **Two-Spotted Mite**. Maximum of 1 application per season.	L Bee:L	R2
Pyridaben (Sanmite)	10A	Contact	14	A	ALL	Registered in grapes (not wine) for control of **Bunch Mite**. Apply at first signs of mite activity before a high population develops. Maximum of 1 application per season.	L Bee:L	-
Sulfur	M2	Contact	NR	P-A	ALL	Registered in table grapes for control of Vine Mite and Grapeleaf Blister Mite (excl. QLD).	L Bee:L	-
Acequinocyl (Kanemite) UPL	20B	Contact & Ingestion		P		Registered for control of **Two Spotted Mite** in pome fruit and stone fruit.	L Bee:L	-
Beauveria bassiana (Velifer) BASF	UNF	Biological		P		Registered for suppression of **Two Spotted Mite** in protected vegetables and ornamentals.	L Bee:L	-
Chlorfenapyr (Secure) BASF	13	Contact & Ingestion		P		Registered for control of **Two Spotted Mite** in apples, pears and peaches.	M 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		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of **Two Spotted Mite** and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of **Two Spotted Mite** and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	-	-
Spiromesifen (Oberon) Bayer	23	Ingestion		P		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	-
Tebufenpyrad (Pyranica) Sipcam	21A	Contact & Ingestion		P		Registered for control of **Two Spotted Mite** in apples, pears, peaches and ornamentals.	M Bee:H	-
Light Brown Apple Moth (*Epiphyas postvittana*) **Priority: Moderate**								
Rated as a high priority in WA, and as a moderate priority in QLD, SA and VIC. Light Brown Apple Moth feed predominantly on leaves but can cause extensive damage to flowers and setting berries if large populations are present. Regular monitoring and an integrated approach including preserving beneficial species and good vineyard hygiene should be used.								
Abamectin + Chlorantraniliprole (Voliam Targo) Syngenta	6+28	Ingestion	28 G:28	A	ALL	Registered in grapes for control of **Light Brown Apple Moth**, Grapevine Moth, Two-Spotted Mite, Grapeleaf Rust Mite and suppression of Garden Weevil. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	M Bee:H	-
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion	NR NG	A	ALL	Registered in grapevines for control of Grapevine Scale, Long Tailed Mealybug and **Light Brown Apple Moth**. Apply pre-flowering when LBAM are first detected. Maximum of 2 applications per season with a retreatment interval of 7-14 days.	M Bee:M	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Bacillus thuringiensis subsp Kurstaki Strain HD-1	11	Biological	NR	A	ALL	Registered in vines for control of Armyworm, Cotton Bollworm, Native Budworm, Cabbage Moth, Cabbage White Butterfly, Loopers, **Light Brown Apple Moth** and Vine Moth. Apply to newly hatched larvae, late in the afternoon or early evening. Apply a minimum of 2 sprays separated by no more than 3 days initially, and then reapply at 3-5 day intervals. Maximum number of applications not specified.	VL Bee:L	-
Chlorantraniliprole (Altacor) FMC	28	Ingestion	56 NG	A	ALL	Registered in grapes for control of **Light Brown Apple Moth** and Grapevine Moth. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days. Do not apply after bunch closure.	L Bee:VL	-
Chlorpyrifos	1B	Contact	14	A	ALL	Registered in grapes for control of **Light Brown Apple Moth**. Apply initial spray just after berry set (early October). Repeat application as required. Maximum number of applications and retreatment interval not specified.	H Bee:H	R1
E-11-Tetradecen-1-YL Acetate + E,E-9,11-Tetradecadien-1-YL Acetate (LBAM Isomate)	-	Mating Disruption	NR	A	ALL	Registered in grapes as an insect confusion agent for control of Light Brown Apple Moth. Twist dispensers around old wood approximately 300mm below the top of the canopy. Use immediately prior to the first moth emergence in spring.	VL Bee:VL	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	56 G:56	A	ALL	Registered in grapes (except grapes grown for dried fruit production) for control of **Light Brown Apple Moth** and Grapevine Moth. Maximum of 2 applications per season, with a minimum retreatment interval of 7-14 days. Do not apply after bunch closure.	M Bee:H	-
Ethyl Formate	-	Post-Harvest Fumigant	NR	A	ALL	Registered as a post-harvest treatment in table grapes for control of **Light Brown Apple Moth**, Redback Spiders, Two-Spotted Mites, Long Tailed Mealybug, Western Flower Thrips and Plague Thrips.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Indoxacarb (Avatar) FMC	22A	Ingestion	56 NG	A	ALL	Registered in grapes for control of Garden Weevil, Grapevine Moth, Inland Katydid, **Light Brown Apple Moth** and Wingless Grasshopper. Maximum of 3 applications per season, with a minimum retreatment interval of 10 days. Do not apply after bunch closure.	L Bee:H	R3
Methomyl (Lannate)	1A	Contact	7	A	ALL	Registered in grapes for control of **Light Brown Apple Moth** and Vine Moth. Apply during early shoot growth / flowering if pests are a problem and again just before bunches close. Maximum number of applications and retreatment interval not specified.	H Bee:H	R2
Methoxyfenozide (Prodigy)	18	Ingestion	21 NG	A	ALL	Registered in grapevines for control of **Light Brown Apple Moth**. Target eggs and small larvae. Maximum of 3 applications per season, with a retreatment interval of 14-21 days.	VL Bee:VL	-
Spinetoram (Delegate) Corteva	5	Ingestion	7 NG	A	ALL	Registered in grapes for control of **Light Brown Apple Moth** and Grapevine Moth. Target applications against mature eggs and newly hatched larvae. Maximum of 4 applications per season, with a minimum retreatment interval of 14 days.	M Bee:H	-
Tebufenozide (Mimic)	18	Ingestion	21	A	ALL	Registered in grapevines for control of **Light Brown Apple Moth**. Target eggs and small larvae. Maximum of 2 applications per season, with a retreatment interval of 14-21 days.	L Bee:L	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Tetraniliprole (Vayego) Bayer	28	Ingestion		P	ALL	Registered for control of **Light Brown Apple Moth** in pome fruit.	L-M Bee:VH	-
Western Flower Thrips (*Frankliniella occidentalis*) **Plague Thrips** (*Thrips imaginis*) **Onion Thrips** (*Thrips tabaci*) **Priority: Moderate**								
Western Flower Thrips are rated as a high priority in WA, a moderate priority in QLD, and as a low priority in SA and VIC. Plague Thrips are rated as a moderate priority in VIC and WA, and as a low priority in SA. Onion Thrips are rated as a moderate priority in WA, and as a low priority in SA and VIC. Thrips feed on developing fruit causing blemishes which downgrade fruit quality. Regular monitoring and timely and judicious use of insecticides is required to control thrips.								
Ethyl Formate	-	Post-Harvest Fumigant	NR	A	ALL	Registered as a post-harvest treatment in table grapes for control of Light Brown Apple Moth, Redback Spiders, Two-Spotted Mites, Long Tailed Mealybug, **Western Flower Thrips** and **Plague Thrips**.	-	-
Spirotetramat (Movento) Bayer	23	Ingestion	28	A	ALL	Registered in grapes for control of Longtailed Mealybug and Tuber Mealybug and suppression of Grapevine Scale, **Plague Thrips** and Northern Plague Thrips. Peak time for thrips damage is during flowering and berry set. Commence applications prior to anticipated peak thrips activity. Maximum of 2 applications per season, with a retreatment interval of 14-28 days.	M Bee:VL	-
Tau-Fluvalinate (Mavrik)	3A	Contact	NR	A	ALL (excl. NT & TAS)	Registered in table grapes for control of **Plague Thrips**. Apply just prior to or at start of flowering. Second application may be required 10-14 days after the first application. Do not apply after of the blossom period.	VH Bee:H	-
Spinetoram (Delegate) Corteva	5	Ingestion	7 NG	P-A	ALL	Registered in grapes for control of Light Brown Apple Moth and grapevine Moth. Registered for control of **Western Flower Thrips** in pome fruit and stone fruit.	M 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		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of **Onion Thrips** and **Plague Thrips** in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite**, Western Flower Thrips**, Tomato Thrips, Melon Thrips, **Plague Thrips** and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, **Western Flower Thrips**, Tomato Thrips, Melon Thrips, **Plague Thrips** and Heliothis 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.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Redback Spiders (*Latrodectus hasseltii*) **Priority: Moderate**								
Rated as a high priority in QLD, SA and WA, and as a low priority in VIC. Redback Spiders contamination of fruit presents a risk to growers, packhouse staff and ultimately to consumers. Chemical control in crop is not generally effective, and growers should practice good hygiene in and around fields to reduce infestation in the first place. Machinery and harvesting equipment should be kept clean and can be sprayed with broad spectrum insecticides to reduce the risk of spiders harbouring.								
Ethyl Formate	-	Post-Harvest Fumigant	NR	A	ALL	Registered as a post-harvest treatment in table grapes for control of Light Brown Apple Moth, **Redback Spiders**, Two-Spotted Mites, Long Tailed Mealybug, Western Flower Thrips and Plague Thrips.	-	-
Methomyl (Lannate) PER85594	1A	Contact	7	A	ALL (excl. NSW & WA)	Permitted in table grapes for control of **Redback Spiders**. Maximum of 6 applications per season, with a minimum retreatment interval of 28 days.	H Bee:H	R2
Snails & Slugs (*Gastropoda* spp.) **Priority: Moderate**								
Rated as a high priority in VIC, a moderate priority in SA, and as a low priority in WA. Snails and Slugs cause damage to buds and foliage, particularly during spring. Management should include regular monitoring, baiting, managing weeds and mowing the inter-row and banding vine trunks with copper foil or copper sulfate to prevent snails from climbing trees.								
Iron EDTA Complex	-	Contact	NR G:7	A	ALL	Registered in grapes for control of **Common Garden Snail** & **White Snail**. Spread pellets evenly on ground. Maximum number of applications and re-treatment interval not specified.	-	-
Metaldehyde	-	Contact & Ingestion	7 NG	A	ALL	Registered in grapevines for control of **Slugs and Snails**.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Grapevine Hawk Moth (*Hippotion celerio*) **Grapevine Moth** (*Phalaenoides glycinae*) **Pear & Cherry Slug** (*Caliroa cerasi*) **Priority: Low**								
Grapevine Hawk Moth and Grapevine Moth are rated as a moderate priority in WA, and as a low priority in QLD, SA and VIC. Pear and Cherry Slug is rated as a low priority in QLD, SA, VIC and WA. These are occasional pests of grapevines but they can be voracious leaf feeders if present in high numbers. Extensive defoliation can occur if not controlled.								
Abamectin + Chlorantraniliprole (Voliam Targo) Syngenta	6+28	Ingestion	28 G:28	A	ALL	Registered in grapes for control of Light Brown Apple Moth, **Grapevine Moth**, Two-Spotted Mite, Grapeleaf Rust Mite and suppression of Garden Weevil. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	M Bee:H	-
Chlorantraniliprole (Altacor) FMC	28	Ingestion	56 NG	A	ALL	Registered in grapes for control of Light Brown Apple Moth and **Grapevine Moth**. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days. Do not apply after bunch closure.	L Bee:VL	-
Chlorpyrifos	1B	Contact	14	A	ALL (excl. VIC)	Registered in grapes for control of Grapevine Scale and **Grapevine Moth**. Apply initial spray just after berry set (early October). Repeat application as required. Maximum number of applications and retreatment interval not specified.	H Bee:H	R1
Emamectin (Proclaim Opti) Syngenta	6	Ingestion	56 G:56	A	ALL	Registered in grapes (except grapes grown for dried fruit production) for control of Light Brown Apple Moth and **Grapevine Moth**. Maximum of 2 applications per season, with a minimum retreatment interval of 7-14 days. Do not apply after bunch closure.	M Bee:H	-
Malathion	1B	Contact	3	A	ALL (excl. QLD)	Registered in grapevines for control of Grapevine Scale, Mealybug and **Grapevine Moth**. Maximum number of applications and retreatment interval not specified.	H Bee:H	R3
Methomyl (Lannate)	1A	Contact	7	A	ALL	Registered in grapes for control of Light Brown Apple Moth and **Vine Moth**. Apply during early shoot growth / flowering if pests are a problem and again just before bunches close. Maximum number of applications and retreatment interval not specified.	H Bee:H	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Spinetoram (Delegate) Corteva	5	Ingestion	7 NG	A	ALL	Registered in grapes for control of Light Brown Apple Moth and **Grapevine Moth**. Target applications against mature eggs and newly hatched larvae. Maximum of 4 applications per season, with a minimum retreatment interval of 14 days.	M Bee:H	-
Trichlorfon	1B	Contact	2 G:2	A	QLD, SA, WA & NT	Registered in grapevines for control of **Grapevine Moth**. Maximum number of applications and retreatment interval not specified.	H Bee:H	R2
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion	NR NG	P-A	ALL	Registered in grapevines for control of Grapevine Scale, Long Tailed Mealybug and Light Brown Apple Moth.	M Bee:M	R2
Indoxacarb (Avatar) FMC	22A	Ingestion	56 NG	P-A	ALL	Registered in grapes for control of Garden Weevil, Grapevine Moth, Inland Katydid, Light Brown Apple Moth and Wingless Grasshopper.	L Bee:H	R3
Methoxyfenozide (Prodigy)	18	Ingestion	21 NG	P-A	ALL	Registered in grapevines for control of Light Brown Apple Moth.	VL Bee:VL	-
Tebufenozide (Mimic)	18	Ingestion	21	P-A	ALL	Registered in grapevines for control of Light Brown Apple Moth.	L Bee:L	-
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	-	-
Tetraniliprole (Vayego) Bayer	28	Ingestion		P	ALL	Registered for control of various caterpillars in pome fruit and stone fruit.	L-M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Fall Armyworm (*Spodoptera frugiperda*) **Priority: Low**								
Rated as a low priority in QLD, SA, VIC and WA. Fall Armyworm is an exotic pest that can reproduce prolifically, especially in warm weather. It is important to monitor crops for any incursions. Permits for control of Fall Armyworm in grapes will not be renewed as it has not proven to be a problem pest in grapevines.								
Chlorantraniliprole (Altacor) FMC PER89259	28	Ingestion	56 NG	A	ALL (excl. VIC)	Permitted in grapes for control of **Fall Armyworm**.	L Bee:VL	-
Emamectin (Proclaim Opti) Syngenta PER89263	6	Ingestion	56 G:56	A	ALL (excl. VIC)	Permitted in grapes for control of **Fall Armyworm**.	M Bee:H	-
Emamectin (Clama 50SC) PER92220	6	Ingestion	56 G:56	A	ALL (excl. VIC)	Permitted in grapes for control of **Fall Armyworm**.	M Bee:H	-
Indoxacarb (Avatar) FMC PER89278	22A	Ingestion	56 NG	A	ALL (excl. VIC)	Permitted in grapes for control of **Fall Armyworm**.	L Bee:H	R3
Methomyl (Lannate) PER89293	1A	Contact	7	A	ALL	Permitted in grapes for control of **Fall Armyworm**.	H Bee:H	R2
Spinetoram (Delegate) Corteva PER89241	5	Ingestion	7 NG	A	ALL (excl. VIC)	Permitted in grapes for control of **Fall Armyworm**.	M Bee:H	-
Spinosad (Entrust Organic) Corteva PER89870	5	Ingestion	14 G:14	A	ALL (excl. VIC)	Permitted in grapes for control of **Fall Armyworm**.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Grapeleaf Rust Mite (*Calepitrimerus vitis*) **Grapeleaf Blister / Bud Mite** (*Colomerus vitis*) **Broad Mite** (*Polyphagotarsone-mus latus*) **Citrus Flat Mite** (*Brevipalpus lewisi*) **European Red Mite** (*Panonychus ulmi*) **Priority: Low**								
Grapeleaf Rust Mite is rated as a moderate priority in VIC, and as a low priority in SA and WA. Grapeleaf Blister / Bud Mite is rated as a moderate priority in SA and VIC, and as a low priority in WA. Broad Mite, Citrus Flat Mite and European Red Mite are rated as a low priority in SA, VIC and WA. Bud Mite feeding can lead to malformed leaves, aborted or damaged bunches, tip death and even bud death. Other mite species predominantly affect the foliage and can cause extensive leaf damage if present in large numbers.								
Abamectin + Chlorantraniliprole (Voliam Targo) Syngenta	6+28	Ingestion	28 G:28	A	ALL	Registered in grapes for control of Light Brown Apple Moth, Grapevine Moth, Two-Spotted Mite, **Grapeleaf Rust Mite** and suppression of Garden Weevil. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	M Bee:H	-
Fenbutatin Oxide (Torque) PER13378	12B	Contact	14	A	ALL (excl. VIC)	Permitted in table grapes for control of **Rust Mite** and Two-Spotted Mite. Maximum of 1 application per season.	L Bee:L	R2
Sulfur	M2	Contact	NR	A	ALL (excl. QLD)	Registered in table grapes for control of Vine Mite and **Grapeleaf Blister Mite**. Apply before sprouting. Maximum number of applications and retreatment interval not specified.	L Bee:L	-
Acequinocyl (Kanemite) UPL	20B	Contact & Ingestion		P		Registered for control of Two Spotted Mite in pome fruit and stone fruit.	L Bee:L	-
Beauveria bassiana (Velifer) BASF	UNF	Biological		P		Registered for suppression of Two Spotted Mite in protected vegetables and ornamentals.	L Bee:L	-
Chlorfenapyr (Secure) BASF	13	Contact & Ingestion		P		Registered for control of Two Spotted Mite in apples, pears and peaches.	M 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		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of **Broad Mite**, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and **Broad Mite** and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	-	-
Spiromesifen (Oberon) Bayer	23	Ingestion		P		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	-
Tebufenpyrad (Pyranica) Sipcam	21A	Contact & Ingestion		P		Registered for control of Two Spotted Mite in apples, pears, peaches and ornamentals.	M Bee:H	-
African Black Beetle (*Heteronychus arator*) **Garden Weevil** (*Phlyctinus callosus*) **Apple Weevil / Curculio Beetle** (*Otiorhynchus cribricollis*) **Black Vine Weevil** (*Otiorhynchus sulcatus*) **Common Auger Beetle** (*Xylopsocus gibbicolis*) **Elephant Weevil** (*Orthorhinus cylindrirostris*) **Vine Weevil** (*Orthorhinus klugi*) **Priority: Low**								
Rated as a low priority in QLD, SA, VIC and WA. African Black Beetle, Garden Weevil and Apple Weevil can present problems during grapevine establishment. They will ringbark young vines, potentially weakening canes and sometimes killing vines. Chemical control id best performed before planting, especially on sites with a history of such pests.								
Abamectin + Chlorantraniliprole (Voliam Targo) Syngenta	6+28	Ingestion	28 G:28	A	ALL	Registered in grapes for control of Light Brown Apple Moth, Grapevine Moth, Two-Spotted Mite, Grapeleaf Rust Mite and suppression of **Garden Weevil**. Maximum of 2 applications per season, with a minimum retreatment interval of 14 days.	M Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Alpha Cypermethrin	3A	Contact	NR	A	ALL (excl. QLD)	Registered in grapevines (non-bearing) for control of Pink Cutworm, **Apple Weevil / Curculio Beetle** and **Garden Weevil**. Spray at first sign of leaf damage to the leaves, cane and soil around each vine. Apply a second application 3 weeks later if pests persist.	VH Bee:H	-
Esfenvalerate (Sumi-Alpha)	3A	Contact	NR	A	ALL (excl. QLD)	Registered in grapevines for control of **Garden Weevil**. Apply after peak weevil emergence in the late spring but before damage. A second application 2-4 weeks later may be required. Maximum of 2 applications per season.	VH Bee:H	-
Indoxacarb (Avatar) FMC	22A	Ingestion	56 NG	A	ALL	Registered in grapes for control of **Garden Weevil**, Grapevine Moth, Inland Katydid, Light Brown Apple Moth and Wingless Grasshopper. Maximum of 3 applications per season, with a minimum retreatment interval of 10 days. Do not apply after bunch closure.	L Bee:H	R3
Tetraniliprole (Vayego) Bayer	28	Ingestion		P	ALL	Registered for control of **Apple Weevil** and **Garden Weevil in** pome fruit and stone fruit.	L-M Bee:VH	-
Phylloxera (*Daktulosphaira vitifolia*) **Priority: Low**								
Rated as a high priority in SA, and as a low priority in QLD, VIC and WA. Phylloxera are a small insect that are mainly on grapevine roots although leaf-galling populations sometimes occur. Root feeding leads to vine debilitation and usually death of European vines within 6 years. Rootstocks provide varying degrees of tolerance to Phylloxera.								
Glyphosate (Roundup) PER12770	9	Vine Removal	NR	A	QLD	Permitted in grapevines for removal of unwanted and abandoned vines to minimise the risk of **Phylloxera**. Apply as a cut stump method.	-	R3
Sodium Metabisulfite PER11748	M	Post-Harvest Treatment	NR	A	QLD	Permitted in table grapes (packaged) as a post-harvest treatment for control of **Phylloxera**.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Grapevine Scale (*Parthenolecanium persicae*) **Priority: Low**								
Rated as a high priority in SA, a moderate priority in WA, and as a low priority in VIC. Scale infests leaves, fruits, twigs and limbs of grapevines. Severe infestations will impact on general tree health and can cause fruit quality problems. An integrated management approach is effective and should incorporate the reduction of dust in the orchard, preservation of parasitoid species and the timely and judicious use of insecticides. Ant control is important because they often defend scale insects from predators and parasites.								
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion	NR NG	A	ALL	Registered in grapevines for control of **Grapevine Scale**, Long Tailed Mealybug and Light Brown Apple Moth. Apply early in the season when crawlers are active and good coverage can be achieved. Maximum of 2 applications per season with a minimum retreatment interval of 21 days.	M Bee:M	R2
Chlorpyrifos	1B	Contact	14	A	ALL (excl. VIC)	Registered in grapes for control of **Grapevine Scale** and Grapevine Moth. Apply initial spray just after berry set (early October). Repeat application as required. Maximum number of applications and retreatment interval not specified.	H Bee:H	R1
Malathion	1B	Contact	3	A	ALL (excl. QLD)	Registered in grapevines for control of **Grapevine Scale**, Mealybug and Grapevine Moth. Maximum number of applications and retreatment interval not specified.	H Bee:H	R3
Petroleum Oil	-	Contact	NR	A	ALL	Registered in grapes for control of **Grapevine Scale**. Maximum number of treatments and retreatment interval not specified.	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion	28	A	ALL	Registered in grapes for control of Longtailed Mealybug and Tuber Mealybug and suppression of **Grapevine Scale**, Plague Thrips and Northern Plague Thrips. Commence applications after budburst at the onset of crawler emergence or when pest numbers reach economic threshold. Apply a second application 21-38 days after the first application if required. Maximum of 2 applications per season.	M Bee:VL	-
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	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory Risk
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in 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	-
Inland Katydid (*Caedicia simplex*) **Priority: Low**								
Rated as a moderate priority in SA, and as a low priority in VIC and WA. Katydids are an infrequent pest of grapevines.								
Indoxacarb (Avatar) FMC	22A	Ingestion	56 NG	A	ALL	Registered in grapes for control of Garden Weevil, Grapevine Moth, **Inland Katydid**, Light Brown Apple Moth and Wingless Grasshopper. Maximum of 3 applications per season, with a minimum retreatment interval of 10 days. Do not apply after bunch closure.	L Bee:H	R3
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of various sucking pests in macadamias, avocados, mangoes, papaya, cucurbits, eggplant, peppers, tomatoes, green beans, potatoes and sweet potatoes. US registration for control of **Katydid** nymphs in citrus.	L Bee:L	-

4.3 Weeds in table grape

4.3.1 Weed priorities

Common Name	Scientific Name
High	
Flaxleaf Fleabane	*Conyza bonariensis*
Moderate	
Feather Top Rhodes Grass	*Chloris virgata*
Couch Grass	*Cynodon dactylon*
Marshmallow	*Malva parviflora*
Fat Hen	*Chenopodium album*
Nutgrass	*Cyperus rotundus*
Low	
Ryegrass	*Lolium* spp.
Docks	*Rumex* spp.
Evening Primrose	*Oenothera* spp.
Hairy Willow Herb	*Epilobium hirsutum*
Soursob	*Oxalis pes-caprae*
Sowthistle	*Sonchus oleraceus*

Flaxleaf Fleabane was identified as the high priority weed in the feedback. An integrated weed management program incorporating mulch and inter-row grass cover should be used to reduce reliance on herbicides in vineyards.

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].

This report uses the new numerical herbicide mode of action classifications. Refer to the CropLife website[7] to compare these to the previous alphabetical classifications.

[6] https://www.croplife.org.au/resources/programs/resistance-management/herbicide-resistance-management-strategies-2/
[7] https://www.croplife.org.au/wp-content/uploads/2021/07/A2-poster_03_FINAL.pdf

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
Flaxleaf Fleabane (*Conyza bonariensis*) **Priority: High**							
Rated as a high priority in SA, VIC and WA. 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.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Flumioxazin (Chateau)	14**	Grapevines / Residual Weed Control	Registered in grapevines for control of grass and broadleaf weeds, including **Flaxleaf Fleabane**. Apply to bare soil using a directed spray at the base of vines.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds, including **Flaxleaf Fleabane**.	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**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds, including **Flaxleaf Fleabane**. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
Saflufenacil (Sharpen) BASF	14**		Registered for control of grass and broadleaf weeds, including **Flaxleaf Fleabane,** in citrus, pome and almond orchards.		P		-
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		-
Feather Top Rhodes Grass (*Chloris virgata*) **Priority: Moderate**							
Rated as a moderate priority in SA and VIC, and as a low priority in WA. Feathertop Rhodes Grass is an aggressive grass weed that is difficult to control with herbicides. Multiple applications are required.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Fluazifop-P (Fusilade)	1***	Grapes / Directed Spray	Registered in grapes as a directed spray for the control of grass weeds, including **Feather Top Rhodes Grass**.	28	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Flumioxazin (Chateau)	14**	Grapevines / Residual Weed Control	Registered in grapevines for control of grass and broadleaf weeds, including **Feather Top Rhodes Grass**. Apply to bare soil using a directed spray at the base of vines.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Grapevines / Directed Spray	Registered in grapevines for control of grass weeds, including **Feather Top Rhodes Grass**. Apply as a directed spray.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
Quizalofop-P-Ethyl	1***	Grapes / Directed Spray	Registered in grapes for handgun spraying to control various grass weeds, including **Rhodes Grass**.	NR	A	ALL	-
Trifluralin	3**	Vineyards / Pre-Plant Residual	Registered in vineyards as a pre-plant residual for control of grass and broadleaf weeds, including **Rhodes Grass**. Apply to new planting during pre-plant cultivation.	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		-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Couch Grass (*Cynodon dactylon*) **Priority: Moderate**							
Rated as a high priority in SA and WA, and as a low priority in VIC. 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.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Fluazifop-P (Fusilade)	1***	Grapes / Directed Spray	Registered in grapes as a directed spray for the control of grass weeds, including **Couch Grass**.	28	A	ALL	-
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Grapevines / Directed Spray	Registered in grapevines for control of grass weeds, including **Couch Grass**. Apply as a directed spray.	NR	A	ALL	-
Nonanoic Acid (Beloukha)	-	Vineyards / Directed Spray	Registered in vineyards for control of grass and broadleaf weeds, including **Couch Grass**. Apply at early vegetative stage of weeds and repeat after 7 days if required.	NR	A	ALL	-
Norflurazon (Zoliar) AgNova	12**	Grapes / Directed Spray / Pre-Emergence	Registered in grapes for pre-emergence control of grass and broadleaf weeds, including **Couch Grass**.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	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**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
Quizalofop-P-Ethyl	1***	Grapes / Directed Spray	Registered in grapes for handgun spraying to control various grass weeds, including **Couch Grass**.	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		-
Marshmallow (*Malva parviflora*) **Priority: Moderate**							
Rated as a moderate priority in SA, VIC and WA. Adapted to a wide variety of environments and highly competitive weed. Control with knockdown herbicides can be unreliable.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Carfentrazone (Hammer)	14**	Grapevines / Directed Spray or Spot Spray	Registered in grapevines 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**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Flumioxazin (Chateau)	14**	Grapevines / Residual Weed Control	Registered in grapevines for control of grass and broadleaf weeds, including **Marshmallow**. Apply to bare soil using a directed spray at the base of vines.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Isoxaben (Gallery) Corteva	29**	Bearing & Non-Bearing Vineyards / Residual Weed Control	Registered in bearing and non-bearing vineyards 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**	Grapevines / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in grapevines 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**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
Saflufenacil (Sharpen) BASF	14**		Registered for control of grass and broadleaf weeds, including **Marshmallow,** in citrus, pome and almond orchards.		P		-
Fat Hen (*Chenopodium album*) **Priority: Moderate**							
Rated as a high priority in WA, a moderate priority in VIC, and as a low priority in 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.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Flumioxazin (Chateau)	14**	Grapevines / Residual Weed Control	Registered in grapevines for control of grass and broadleaf weeds, including **Fat Hen**. Apply to bare soil using a directed spray at the base of vines.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Bearing & Non-Bearing Vineyards / Residual Weed Control	Registered in bearing and non-bearing vineyards 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	-
Nonanoic Acid (Beloukha)	-	Vineyards / Directed Spray	Registered in vineyards for control of grass and broadleaf weeds, including **Fat Hen**. Apply at early vegetative stage of weeds and repeat after 7 days if required.	NR	A	ALL	-
Oryzalin (Surflan)	3**	Grapes / Pre-Emergence	Registered in grapes for control of various grass and broadleaf weeds, including **Fat Hen**. Apply as a pre-emergent surface applied herbicide.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Grapevines / Directed Spray / Tank Mix with Glyphosate, Paraquat or Paraquat/Diquat	Registered in grapevines 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	-
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	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**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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**	Vineyards / Pre-Plant Residual	Registered in vineyards as a pre-plant residual for control of grass and broadleaf weeds, including **Fat Hen**. Apply to new planting during pre-plant cultivation.	NR	A	QLD, SA, WA, VIC & TAS	-
Pendimethalin (Stomp)	3**	Grapevines	Registered in grapevines for control of grass and broadleaf weeds, including **Fat Hen**. 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	-
Simazine	5**	Vines / Established At Least 3 Years	Registered in vines for control of grass and broadleaf weeds, including **Fat Hen**.	NR	A	ALL	R3
Saflufenacil (Sharpen) BASF	14**		Registered for control of grass and broadleaf weeds, including **Fat Hen,** in citrus, pome and almond orchards.		P		-
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		-
Nutgrass (*Cyperus rotundus*) **Priority: Moderate**							
Rated as a high priority in SA, a moderate priority in VIC, and as a low priority in WA. Nutgrass prefers damp, water-logged soils but can survive for years underground during dry times. Herbicide options are limited and unreliable. Improve soil drainage if possible.							
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Norflurazon (Zoliar) AgNova	12**	Grapes / Directed Spray / Pre-Emergence	Registered in grapes for pre-emergence control of grass and broadleaf weeds, including **Nutgrass**.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Ryegrass (*Lolium* spp.) **Priority: Low**							
Rated as a high priority in WA, a moderate priority in SA, and as a low priority in VIC. 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**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Fluazifop-P (Fusilade)	1***	Grapes / Directed Spray	Registered in grapes as a directed spray for the control of grass weeds, including **Feather Top Rhodes Grass**.	28	A	ALL	-
Flumioxazin (Chateau)	14**	Grapevines / Residual Weed Control	Registered in grapevines for control of grass and broadleaf weeds, including **Annual Ryegrass**. Apply to bare soil using a directed spray at the base of vines.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Grapevines / Directed Spray	Registered in grapevines for control of grass weeds, including **Annual Ryegrass**. Apply as a directed spray.	NR	A	ALL	-
Napropamide (Devrinol)	0**	Grapevines / Directed Spray	Registered in grapevines for control of various grass and broadleaf weeds, including **Annual Ryegrass**.	NR NG	A	NSW, VIC, TAS & SA	-
Norflurazon (Zoliar) AgNova	12**	Grapes / Directed Spray / Pre-Emergence	Registered in grapes for pre-emergence control of grass and broadleaf weeds, including **Annual Ryegrass**.	NR	A	ALL	-
Oryzalin (Surflan)	3**	Grapes / Pre-Emergence	Registered in grapes for control of various grass and broadleaf weeds, including **Annual Ryegrass**. Apply as a pre-emergent surface applied herbicide.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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**	Grapevines	Registered in grapevines for control of 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	-
Quizalofop-P-Ethyl	1***	Grapes / Directed Spray	Registered in grapes for handgun spraying to control various grass weeds, including **Ryegrass**.	NR	A	ALL	-
Simazine	5**	Vines / Established At Least 3 Years	Registered in vines for control of grass and broadleaf weeds, including **Annual Ryegrass**.	NR	A	ALL	R3
Trifluralin	3**	Vineyards / Pre-Plant Residual	Registered in vineyards as a pre-plant residual for control of grass and broadleaf weeds, including **Ryegrass**. Apply to new planting during pre-plant cultivation.	NR	A	QLD, SA, WA, VIC & TAS	-
Saflufenacil (Sharpen) BASF	14**		Registered for control of grass and broadleaf weeds, including **Ryegrass,** in citrus, pome and almond orchards.		P		-
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
Dock (*Rumex* spp.) **Priority: Low**							
Rated as a low priority in SA, VIC and WA. Widespread species that is prolific and difficult to control when established.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Norflurazon (Zoliar) AgNova	12**	Grapes / Directed Spray / Pre-Emergence	Registered in grapes for pre-emergence control of grass and broadleaf weeds, including **Dock**.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
Evening Primrose (*Oenothera* spp.) **Priority: Low**							
Rated as a low priority in SA, VIC and WA. Broadleaf weed that can be annual or perennial, it re-shoots from fleshy underground roots and is difficult to control with herbicides and mechanical means.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
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 Willow Herb (*Epilobium hirsutum*) **Priority: Low**							
Rated as a low priority in SA, VIC and WA. Aggressive broadleaf perennial which is currently only found in Victoria. It can reproduce from seed dispersal as well as underground rhizomes.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
Soursob (*Oxalis pes-caprae*) **Priority: Low**							
Rated as a moderate priority in SA, and as a low priority in VIC and WA. Soursob is a low growing broadleaf that is highly competitive with other vegetation. It is difficult to control with herbicides.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Norflurazon (Zoliar) AgNova	12**	Grapes / Directed Spray / Pre-Emergence	Registered in grapes for pre-emergence control of grass and broadleaf weeds, including **Soursob**.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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
Simazine	5**	Vines / Established At Least 3 Years	Registered in vines for control of grass and broadleaf weeds, including **Creeping Oxalis**.	NR	A	ALL	R3
Trifluralin	3**	Vineyards / Pre-Plant Residual	Registered in vineyards as a pre-plant residual for control of grass and broadleaf weeds, including **Soursob**. Apply to new planting during pre-plant cultivation.	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		-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Sowthistle (*Sonchus oleraceus*) **Priority: Low**							
Rated as a low priority in SA, VIC and WA. Annual broadleaf weed that is a prolific seed producer and can grow year-round. Timely herbicide control is required in conjunction with an integrated weed management program.							
Amitrole	34**	Vineyards / Directed Spray	Registered in vineyards as a directed spray for the control of grass and broadleaf weeds. Apply as a directed spray.	56	A	ALL	R3
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Registered in vineyards for residual weed control of annual grass and broadleaf weeds.	NR	A	ALL	R3
Flumioxazin (Chateau)	14**	Grapevines / Residual Weed Control	Registered in grapevines for control of grass and broadleaf weeds, including **Milk Thistle**. Apply to bare soil using a directed spray at the base of vines.	98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Vineyards / Directed Spray	Registered in vineyards for control of various grass and broadleaf weeds.	NR G:56	A	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed Spray, Shielded Spray or Wick Wiper	Registered in vineyards for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the vine, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Bearing & Non-Bearing Vineyards / Residual Weed Control	Registered in bearing and non-bearing vineyards for control of broadleaf weeds, including **Milk Thistle**. 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	-
Napropamide (Devrinol)	0**	Grapevines / Directed Spray	Registered in grapevines for control of various grass and broadleaf weeds, including **Sowthistle**.	NR NG	A	NSW, VIC, TAS & SA	-
Nonanoic Acid (Beloukha)	-	Vineyards / Directed Spray	Registered in vineyards for control of grass and broadleaf weeds, including **Sowthistle**. Apply at early vegetative stage of weeds and repeat after 7 days if required.	NR	A	ALL	-
Norflurazon (Zoliar) AgNova	12**	Grapes / Directed Spray / Pre-Emergence	Registered in grapes for pre-emergence control of grass and broadleaf weeds, including **Sowthistle**.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory Risk
Oryzalin (Surflan)	3**	Grapes / Pre-Emergence	Registered in grapes for control of various grass and broadleaf weeds, including **Sowthistle**. Apply as a pre-emergent surface applied herbicide.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards for control of annual grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	1 G:7	A	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / Directed Spray	Registered in vineyards for control of annual weeds. Avoid contact with crop foliage.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Vineyards / Directed Spray or Spot Spray	Registered in vineyards 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**	Grapevines	Registered in grapevines for control of grass and broadleaf weeds, including **Sowthistle**. 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	-
Simazine	5**	Vines / Established At Least 3 Years	Registered in vines for control of grass and broadleaf weeds, including **Sowthistle**.	NR	A	ALL	R3
Trifluralin	3**	Vineyards / Pre-Plant Residual	Registered in vineyards as a pre-plant residual for control of grass and broadleaf weeds, including **Sowthistle**. Apply to new planting during pre-plant cultivation.	NR	A	QLD, SA, WA, VIC & TAS	-
Saflufenacil (Sharpen) BASF	14**		Registered for control of grass and broadleaf weeds, including **Sowthistle,** in citrus, pome and almond orchards.		P		-
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 table grape

4.4.1 Plant Growth Regulator priorities

PGR Issue
High
Extend Shelf Life
Advancement of Maturity
Fruit Thinning
Moderate
Control of Vegetative Growth

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
Extend Shelf Life **Priority: High**							
Rated as a high priority in VIC, a moderate priority in SA and WA, and as a low priority in QLD.							
1-Methylcyclopropene (Smartfresh)	PGR		Registered for **improved quality after shipping, storage and handling** in apples, mango, plums, apricot, broccoli, cabbage, carrot, cucumber, kiwifruit, melons, nectarine, persimmons, tomatoes, avocados, bananas, lettuce, papaya and pears.		P		-
Amino Ethoxy Vinyl Glycine (Retain)	PGR		Registered for improved harvest management, fruit quality and enhanced storage potential in apples and stonefruit (except cherries)		P		-
Advancement of Maturity **Priority: High**							
Rated as a high priority in VIC, a moderate priority in WA, and as a low priority in QLD and SA.							
Cyanamide (Dormex)	PGR	Table Grapes	Registered in table grapes for regulation of bud burst.	NR	A	ALL	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use	WHP (days)	Availability	States	Regulatory Risk
Ethephon	PGR	Table Grapes / Barlinka	Registered in table grapes to promote early uniform colouring. Apply when 5-30% of berries are coloured (2-4 weeks prior to expected harvest).	14	A	NSW & SA	-
		Table Grapes / Red Emperor, Red Prince, Red Malaga, Cardinal, Muscat of Hamburg				NSW, VIC, SA & WA	
		Table Grapes / Flame Seedless				WA only	
S-Abscisic Acid (Protone)	PGR	Table Grapes / Varieties with Multiple and Extended Harvests	Registered in table grapes to accelerate the red colouration in berries and bunches. Initiate treatments 1 week after veraison, apply multiple applications as required to achieve desired colouration.	NR	A	ALL	-
Methyl Esters of Fatty Acids (Waiken)	PGR		Registered to advance budbreak in cherries. Early budbreak may not translate to earlier flowering.		P		-
Fruit Thinning Priority: High							
Rated as a high priority in QLD, VIC and WA, and as a low priority in SA.							
Calcium Nitrate PER86553	-	Grapevines Used for Dried Fruit	Registered in grapevines used for dried fruit production for Cordon Bunch Removal. Apply at the 6-8 leaf stage, pre-bloom as a foliar spray targeted at the canopy between the cutting line and the cordon.	56	A	ALL	-
Ethephon PER87879	PGR	Grapes Grown for Drying	Registered in grapevines used for dried fruit production for Cordon Bunch Removal. Apply as a foliar spray targeted at the canopy between the cutting line and the cordon. Maximum of 2 applications per season, with a minimum retreatment interval of 7 days.	56	A	ALL (excl. VIC)	-

Active Ingredient (Trade Name)	Chemical Group	Crop / Situation	Comment / Use	WHP (days)	Availability	States	Regulatory Risk
Forchlorfenuron	PGR	Table Grapes / Thompson Seedless, Menindee Seedless, Red Globe	Registered in table grapes for increasing berry size. Apply after post-bloom shatter period to avoid increased fruit set. Direst spray to bunches and fruit. Apply at 4-6 mm berry size.	NR NG	A	ALL	-
Gibberellic Acid	PGR	Grapes	Registered in grapes for fruit thinning and increasing berry size. To achieve thinning, apply at 70% capfall. To achieve increase in berry size, apply 2 applications, the first when berries are 7-9 mm diameter and the second when berries have reached 9-10 mm in diameter.	NR	A	ALL	-
Control of Vegetative Growth **Priority: Moderate**							
Rated as a moderate priority in VIC and WA, and as a low priority in QLD and SA.							
Gibberellins + 6-Benzyladenine (Cytolin)	PGR		Registered for stimulation of lateral growth in red delicious apples and non-bearing cherries.		P		-
Paclobutrazol	PGR		Registered in mangoes to reduce vegetative growth. Apply within 4 weeks after harvest or no later than mid-February. Do not treat trees with a canopy of less than 3m diameter.		P		-
Prohexadione-Calcium (Regalis)	PGR		Registered for reduction of shoot growth in apples and cherries.		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	https://www.legislation.gov.au/Details/F2022C00400
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/
Cotton Pest Management Guide 2022-23	https://www.cottoninfo.com.au/publications/cotton-pest-management-guide
CropLife Australia (Resistance Management)	https://www.croplife.org.au/resources/programs/resistance-management/
Growcom – Infopest Database	www.infopest.com.au
Hort Innovation	www.horticulture.com.au

5.2 Abbreviations and Definitions:

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

5.3 Acknowledgements:

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

6. Appendices:

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

Appendix 1. Products available for disease control in table grape

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Amisulbrom + Tribasic Copper Sulphate (Amicus Blue) Nufarm	21+M1	Grapevines	Downy Mildew	ALL	28	-
Aureobasidium pullalans (Botector) Nufarm	BM02	Grapes	Botrytis Bunch Rot / Grey Mould	ALL	NR	-
Azoxystrobin (Amistar)	11	Grapes	Powdery Mildew Downy Mildew Botrytis Bunch Rot	ALL	14	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Grapevines	Powdery Mildew Downy Mildew Botrytis Bunch Rot	ALL	28	R3
Bacillus amyloliquefaciens strain QST713 (Serenade Opti) Bayer	BM 02	Grapevines	Botrytis	ALL	NR	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Grapevines	Botrytis Bunch Rot	ALL	NR	-
Boscalid (Filan)	7	Grapevines	Botrytis Bunch Rot	ALL	28 NG	-
Bromo Chloro Dimethyl Hydantoin (BCDMH)	-	Sanitiser / Post-Harvest Treatment	External Rot Causing Organisms	ALL	NR	-

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Captan	M4	Grapes	Black Spot Grey Mould Downy Mildew Phomopsis Cane and Leaf Blight	ALL	7 G:7	R3
Chlorine	-	Sanitiser / Post-Harvest Treatment	Bacteria and Fungi	ALL	NR	-
Chlorothalonil (Bravo) Syngenta	M5	Grapes	Downy Mildew Botrytis Bunch Rot	ALL	7 NG	R3
Copper	M1	Grapes	Downy Mildew	ALL	1	-
Cyflufenamid (Flute) AgNova	U6	Grapevines	Powdery Mildew	ALL	35	-
Cyprodinil (Solaris)	9	Grapes / Except Grapes Grown for Dried Fruit Production	Grey Mould / Bunch Rot	ALL	28	-
Difenoconazole (Digger) Nufarm	3	Grapes	Powdery Mildew	ALL	28 G:2	R3
Dimethomorph (Acrobat)	40	Grapevines	Downy Mildew	ALL	28	-
Dimethomorph + Amectotradin (Zampro) AgNova	40+45	Grapevines	Downy Mildew	ALL	28	-
Dimethomorph + Azoxystrobin (Dimazoxy)	40+11	Grapevines	Downy Mildew	ALL	28	-
Dimethomorph + Mancozeb (Acrobat WDG) BASF	40+M3	Grapevines	Downy Mildew	ALL	28	R2

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Dithianon	M9	Grape Vines	Downy Mildew Black Spot Phomopsis Cane and Leaf Spot	ALL	21	R3
Eugenol + Geraniol + Thymol (Novellus)	BM01	Grapes	Grey Mould / Botrytis Bunch Rot	ALL	7	-
Fenhexamid (Teldor) Bayer	13	Grapevines	Botrytis Bunch Rot	ALL	21 G:14	-
Fenpyrazamine (Prolectus) Sumitomo	17	Table Grapes	Grey Mould	ALL	7 G:2	-
Fluazinam (Shirlan)	29	Grapevines	Phomopsis Cane & Leaf Blight Eutypa Dieback	ALL	NR NG	-
Fludioxonil + Cyprodinil (Switch) Syngenta	12+9	Grapes / Except Grapes Grown for Dried Fruit Production	Grey Mould	ALL	28	R3
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Grapevines	Powdery Mildew Botrytis Bunch Rot	ALL	NR NG	R3
Fluoxapiprolin (Xivana Prime) Bayer	49	Grapevines	Downy Mildew	ALL	NR NG	-
Hydrogen Peroxide + Peroxy Acetic Acid (Peratec Plus)	M	Grapes	Grey Mould / Bunch Rot Downy Mildew Powdery Mildew	ALL	1	-
Iodocarb + Cyproconazole (Garrison Rapid Pruning Wound Dressing)	28+3	Grapevines	*Eutypa lata*	ALL (excl. WA)	NR	-
Iprodione (Rovral)	2	Grapes	Grey Mould	ALL	7	R2

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Mancozeb	M3	Grapes	Black Spot	ALL	14	R2
			Downy Mildew	QLD, NSW, VIC, SA & TAS		
			Dead Arm	QLD only		
Mancozeb + Tribasic Copper Sulphate	M3+M1	Grapevines	Downy Mildew	ALL	14	R2
Mancozeb + Metalaxyl-M (Ridomil Gold MZ) Syngenta	M3+4	Grapevines	Downy Mildew	ALL (excl. VIC)	14	R2
Mandipropamid (Revus) Syngenta	40	Grapes	Downy Mildew	ALL	NR NG	-
Mandipropamid + Mancozeb (Revus MZ) Syngenta	40+M3	Grapes	Downy Mildew	ALL	NR NG	R2
Mefentrifluconazole (Belanty) BASF	3	Grapes	Powdery Mildew	ALL	7 NG	-
Metiram (Polyram)	M3	Grapevines	Black Spot Downy Mildew Phomopsis Cane & Leaf Blight	ALL	14	R2
Metrafenone (Vivando) BASF	U8	Grapevines	Powdery Mildew	ALL	35	-
Myclobutanil (Myclonil)	3	Grapevines	Powdery Mildew	ALL	14	R3
Penconazole (Topas)	3	Grapes	Powdery Mildew	ALL	14	R3

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Peroxyacetic Acid	M	Sanitiser / Post-Harvest Treatment	Bacteria	ALL	NR	-
Petroleum Oil	-	Grapes	Powdery Mildew	ALL	NR	-
Phosphorous Acid	P07(33)	Grapes	Downy Mildew	ALL	NR	-
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Grapes	Grey Mould Powdery Mildew	ALL	NR	-
Potassium Bicarbonate (EcoCarb)	M2	Grapevines	Powdery Mildew	ALL	NR	-
Propineb + Oxadixyl (Rebound) Kiwi Rural Trading	M3+4	Grapevines	Downy Mildew	ALL	3	R2
Proquinazid (Talendo) Corteva	13	Grapes	Powdery Mildew	ALL	28	-
Pydiflumetofen (Miravis Adepidyn) Syngenta	7	Grapes	Powdery Mildew	ALL	NR	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Grapes	Botrytis Bunch Rot / Grey Mould Powdery Mildew	ALL	14 NG	R3
Pyraclostrobin (Cabrio)	11	Grapevines	Downy Mildew Powdery Mildew	ALL	21	-
Pyrimethanil (Scala)	9	Grapevines	Botrytis Grey Mould	ALL	7	-
Pyriofenone (Kusabi) AgNova	50	Grapevines	Powdery Mildew	ALL	35 NG	-

Active Ingredient (Trade Name)	Chem. group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Quinoxyfen (Legend)	13	Grapes	Powdery Mildew	ALL	14	R3
Sodium Metabisulphite	M	Grapes (Packaged) / Post-Harvest	Botrytis	ALL	NR	-
Spiroxamine (Prosper)	5	Grapevines	Powdery Mildew	ALL	28	-
Sulfur	M2	Table Grapes	Powdery Mildew	ALL (excl. QLD)	NR	-
Tea Tree Oil (Timorex Gold)		Grapes	Powdery Mildew	ALL	NR	-
Tebuconazole	3	Grapevines	Powdery Mildew	ALL	56	R3
Tetraconazole	3	Grapevines	Powdery Mildew	ALL	14 G:28	R3
Thiram	M3	Grapes	Black Spot / Anthracnose	ALL	7	R2
Triadimefon (Bayfidan)	3	Grapevines	Powdery Mildew	NSW, VIC & WA	14	R3
Triadimenol (Bayfidan)	3	Grapevines	Powdery Mildew	ALL	7	R3
Trichoderma harzianum (Vinevax)	-	Grapevines	Eutypa Dieback Disease	ALL	NR	-
Trifloxystrobin (Flint)	11	Grapevines	Powdery Mildew Suppression of Downy Mildew	ALL	35	-
Zineb	M3	Grapevines	Downy Mildew	ALL	7	R2
Ziram	M3	Grapes	Black Spot	ALL	7	R2

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

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
Abamectin + Chlorantraniliprole (Voliam Targo) Syngenta	6+28	Grapes	Light Brown Apple Moth Grapevine Moth Two-Spotted Mite Grapeleaf Rust Mite Suppression of: Garden Weevil	ALL	28 G:28	-
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Grapevines	Grapevine Scale Long Tailed Mealybug Light Brown Apple Moth	ALL	NR NG	R2
Alpha Cypermethrin	3A	Grapevines / Non-Bearing	Pink Cutworm Apple Weevil / Curculio Beetle Garden Weevil	ALL (excl. QLD)	NR	-
Bacillus thuringiensis subsp Kurstaki Strain HD-1	11	Vines	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	-
Bifenazate (Acramite) PER14492	20D	Table Grapes	Two-Spotted Mite	ALL (excl. VIC)	14 G:28	-
Bifenthrin (Talstar)	3A	Grapes	Fig Longicorn (*Acalolepta vastator*)	NSW, ACT & WA	NR	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Buprofezin (Applaud) Corteva	16	Grapes	Longtail Mealybug Tuber Mealybug Suppression of Grapevine Scale	ALL	56	-
Carbaryl	1A	Grapes / Butt Treatment Only	Cutworms	ALL	NR	R3
Chlorantraniliprole (Altacor) FMC	28	Grapes	Light Brown Apple Moth Grapevine Moth	ALL	56 NG	-
Chlorantraniliprole (Altacor) FMC PER89259	28	Grapes	Fall Armyworm	ALL (excl. VIC)	56 NG	-
Chlorpyrifos	1B	Grapes	Grape Vine Scale Grape Vine Moth	ALL (excl. VIC)	14	R1
			Light Brown Apple Moth	ALL		
Clothianidin (Samurai) Sumitomo	4A	Table Grapes	Queensland Fruit Fly Mediterranean Fruit Fly Long Tailed Mealybug	ALL	7 NG	R2
Cyflumetofen (Danisaraba) BASF	25A	Grape	Two Spotted Mite	ALL	14 NG	-
Deltamethrin (Magmed) PER92548	3A	Grapes / Fruit Fly Traps	Mediterranean Fruit Fly	WA	NR	-
Diazinon	1B	Grapevines	Mealy Bug	VIC, SA & WA	14	R3
			Australian Plague Locust	WA		
Dimethoate PER13859	1B	Fruit Fly Host Crops / After Harvest Only	Fruit Fly	ALL	NR	R1

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
E-11-Tetradecen-1-YL Acetate + E,E-9,11-Tetradecadien-1-YL Acetate (LBAM Isomate)	-	Grapes / Insect Confusion Agent	Light Brown Apple Moth	ALL	NR	-
Emamectin (Proclaim Opti) Syngenta	6	Grapes / Except Grapes Grown for Dried Fruit Production	Light Brown Apple Moth Grapevine Moth	ALL	56 G:56	-
Emamectin (Proclaim Opti) Syngenta PER89263	6	Grapes	Fall Armyworm	ALL (excl. VIC)	56 G:56	-
Emamectin (Clama 50SC) PER92220	6	Grapes	Fall Armyworm	ALL (excl. VIC)	56 G:56	-
Esfenvalerate (Sumi-Alpha)	3A	Grapevines	Garden Weevil	ALL (excl. QLD)	NR	-
Ethyl Formate	-	Table Grapes / Post-Harvest Fumigant	Light Brown Apple Moth Redback Spiders Two-Spotted Mites Long Tailed Mealybug Western Flower Thrips Plague Thrips	ALL	NR	-
Etoxazole (Paramite)	10B	Table Grapes	Two-Spotted Mite	ALL	21 NG	-
Fenbutatin Oxide (Torque) PER13378	12B	Table Grapes	Rust Mite Two-Spotted Mite	ALL (excl. VIC)	14	R2
Fenitrothion	1B	Grapes	Australian Plague Locust	ALL (excl. TAS)	14 G:14	-
Fipronil PER89329	2B	Table Grapevines	Termites	NT	60	R3

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Glyphosate (Roundup) PER12770	9	Grapevines / Removal of Unwanted and Abandoned Vines	Phylloxera	QLD	NR	R3
Indoxacarb (Avatar) FMC	22A	Grapes	Garden Weevil Grapevine Moth Inland Katydid Light Brown Apple Moth Wingless Grasshopper	ALL	56 NG	R3
Indoxacarb (Avatar) FMC PER89278	22A	Grapes	Fall Armyworm	ALL (excl. VIC)	56 NG	R3
Iron EDTA Complex	-	Grapes	Common Garden Snail	ALL	NR G:7	-
			White Snail	ALL (excl. QLD)		
Malathion	1B	Grapevines	Grapevine Scale Mealybug Grapevine Moth	ALL (excl. QLD)	3	R3
			Fruit Fly	ALL (excl. VIC)		
		Table Grapes	Queensland Fruit Fly Mediterranean Fruit Fly			
Metaldehyde	-	Grapevines	Snails & Slugs	ALL	7 NG	
Metarhizium anisopliae (Green Guard)	UNF	Table Grapes	Australian Plague Locust (nymphs) Wingless Grasshopper	ALL	NR	-
Methomyl (Lannate)	1A	Grapevines	Light Brown Apple Moth Vine Moth	ALL	7	R2
Methomyl (Lannate) PER89293	1A	Grapes	Fall Armyworm	ALL	7	R2

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Methomyl (Lannate) PER85594	1A	Table Grapes	Redback Spider	ALL (excl. NSW & WA)	7	R2
Methoxyfenozide (Prodigy)	18	Grapevines	Light Brown Apple Moth\	ALL	21 NG	-
Petroleum Oil	-	Grapes	Mealybugs	ALL (excl. VIC)	NR	-
			Grapevine Scale	ALL		
Pyridaben (Sanmite)	10A	Grapes	Bunch Mite	ALL	14	-
Sodium Metabisulfite PER11748		Table Grapes (packaged)	Phylloxera			-
Spinetoram (Delegate) Corteva	5	Grapes	Light Brown Apple Moth Grapevine Moth	ALL	7 NG	-
Spinetoram (Delegate) Corteva PER89241	5	Grapes	Fall Armyworm	ALL (excl. VIC)	7 NG	-
Spirotetramat (Movento) Bayer	23	Grapes	Longtailed Mealybug Tuber Mealybug Suppression of: Grapevine Scale, Plague Thrips, Northern Plague Thrips	ALL	28	-
Spinosad (Entrust Organic) Corteva PER89870	5	Grapes	Fall Armyworm	ALL (excl. VIC)	14 G:14	-

Active Ingredient (Trade Name)	Chem. group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
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	-
Sulfoxaflor (Transform) Corteva	4C	Table Grapes	Longtailed Mealybug	ALL	NR	R3
Sulfur	M2	Table Grapes	Vine Mite Grapeleaf Blister Mite	ALL (excl. QLD)	NR	-
			Vine Mite	QLD		
Tau-Fluvalinate (Mavrik)	3A	Table Grapes	Plague Thrips	ALL (excl. VIC)	NR	-
Tebufenozide (Mimic)	18	Grapevines	Light Brown Apple Moth	ALL	21	-
Trichlorfon	1B	Grapevines	Grapevine Moth	QLD, SA, WA & NT	2 G:2	R2
Trichlorfon PER12439	1B	Table Grapes	Queensland fruit Fly Mediterranean Fruit Fly	ALL (excl. VIC)	2 G:2	R2

Appendix 3. Products available for weed control in table grape

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Amitrole	34**	Vineyards / Directed Spray	Grass and Broadleaf Weeds	56	ALL	R3
Carfentrazone (Hammer)	14**	Grapevines / Directed Spray or Spot Spray	Selected Broadleaf Weeds	NR G:14	ALL	-
Dichlobenil (Casoran)	29**	Vineyards / Residual Weed Control	Annual Grass and Broadleaf Weeds	NR	ALL	R3
Diquat (Reglone)	22**	Vineyards / Directed Spray / Tank Mix with Paraquat	Capeweed	NR	ALL	R3
Fluazifop-P (Fusilade)	1***	Grapes / Directed Spray	Grass Weeds	28	ALL	-
Flumioxazin (Chateau)	14**	Grapevines / Residual Weed Control	Grass and Broadleaf Weeds	98 G:28	ALL	-
Glufosinate (Basta)	10**	Vineyards	Grass and Broadleaf Weeds	NR G:56	ALL	R3
Glyphosate (Roundup)	9**	Vineyards / Directed or Shielded Spray	Grass and Broadleaf Weeds	NR	ALL	R3
Haloxyfop (Verdict)	1***	Grapevines / Directed Spray or Spot Spray	Grass Weeds	NR	ALL	-
Isoxaben (Gallery) Corteva	29**	Bearing and Non-Bearing Vineyards / Residual Weed Control	Broadleaf Weeds	NR	ALL	-
Napropamide (Devrinol)	0**	Grapevines / Directed Spray	Grass and Broadleaf Weeds	NR NG	NSW, VIC, TAS & SA	-
Nonanoic Acid (Beloukha)	-	Vineyards	Grass and Broadleaf Weeds	NR	ALL	-
		Grapevines	Control of Unwanted Suckers			

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Norflurazon (Zoliar) AgNova	12**	Grapes / Directed Spray	Grass and Broadleaf Weeds (pre-emergence)	NR	ALL	-
Oryzalin (Surflan)	3**	Grapes / Soil Application	Grass and Broadleaf Weeds	NR	ALL	-
Oxyfluorfen (Goal)	14**	Grapevines / 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**	Vineyards / Directed Spray or Spot Spray	Annual Grass and broadleaf weeds	1 G:7	ALL	R3
Paraquat + Amitrole (Guerrilla)	22** + 34**	Vineyards / 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**	Vineyards / Directed Spray	Grass and Broadleaf Weeds	G:1	ALL	R3
Pendimethalin (Stomp)	3***	Grapevines	Grass and Broadleaf Weeds	NR	ALL	-
Quizalofop-P-Ethyl	1***	Grapes / Directed Spray	Grass Weeds	NR	ALL	-
Simazine	5**	Vines / Established At Least 3 Years	Grass and Broadleaf Weeds	NR	ALL	R3
Trifluralin	3**	Vineyards / 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 table grape

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use	WHP (days)	States	Regulatory risk
Calcium Nitrate PER86553	-	Grapevines Used for Dried Fruit	Cordon Bunch Removal	56	ALL	-
Cyanamide (Dormex)	PGR	Table Grapes	Regulation of Bud Burst	NR	ALL	-
Ethephon	PGR	Table Grapes / Barlinka	Promote Early Uniform Colouring	14	NSW & SA	-
		Table Grapes / Red Emperor, Red Prince, Red Malaga, Cardinal, Muscat of Hamburg			NSW, VIC, SA & WA	
		Table Grapes / Flame Seedless			WA only	
Ethephon PER87879	PGR	Grapes Grown for Drying	Cordon Bunch Removal	56	ALL (excl. VIC)	-
Forchlorfenuron	PGR	Table Grapes / Thompson Seedless, Menindee Seedless, Red Globe	Increasing Berry Size	NR NG	ALL	-
Gibberellic Acid	PGR	Grapes	Fruit Thinning and Increase Berry Size	NR	ALL	-

Active ingredient (Trade Name)	Chem. Group	Situation	Comment / Use	WHP (days)	States	Regulatory risk
S-Abscisic Acid (Protone)	PGR	Table Grapes / Varieties with Multiple and Extended Harvests	Accelerate the Red Colouration in Berries and Bunches	NR	ALL	-

Appendix 5. Current permits for use in table grape

Permit No.	Description	Issued Date	Expiry Date	Permit Holder
PER14492 Version 3	Bifenazate (Acramite) / Table Grapes / Two-Spotted Mite	12-Nov-13	31-Aug-25	Hort Innovation
PER86553	Calcium Nitrate / Grapevines Used for Dried Fruit / Cordon Bunch Removal	8-Jan-19	31-Jan-24	Dried Fruits Aust
PER89259 Version 2	Chlorantraniliprole (Altacor) / Grapes / Fall Armyworm	6-Mar-20	31-Mar-23	Hort Innovation
PER92548	Deltamethrin (Magmed) / Grapes / Mediterranean Fruit Fly (WA only)	7-Sep-22	30-Sep-25	Sustainable Ventures
PER13859 Version 2	Dimethoate / Fruit Fly Host Crops / Fruit Fly	9-Feb-15	31-Jul-24	Hort Innovation
PER89263 Version 2	Emamectin (Proclaim Opti) / Grapes / Fall Armyworm	10-Mar-20	31-Mar-23	Hort Innovation
PER92220	Emamectin (Clama 50SC) / Grapes / Fall Armyworm	8-Apr-22	31-Mar-23	Grochem
PER87879	Ethephon / Grapes Grown for Drying / Cordon Bunch Removal	13-Sep-19	30-Sep-24	Dried Fruits Aust
PER13378 Version 4	Fenbutatin Oxide (Torque) / Table Grapes / Rust Mite, Two-Spotted Mite	9-Nov-12	31-Jul-25	Hort Innovation
PER89329	Fipronil / Table Grapevines / Termites	11-Mar-20	31-Mar-23	NT Farmers Association
PER12770 Version 2	Glyphosate / Grapevine removal/destruction / Phylloxera	12-Oct-11	31-Dec-26	ATGA c/- Hort Innovation
PER89278	Indoxacarb (Avatar) / Grapes / Fall Armyworm	13-Mar-20	31-Mar-23	Hort Innovation
PER89293	Methomyl (Lannate) / Grapes / Fall Armyworm	10-Apr-20	30-Apr-23	Hort Innovation
PER85594	Methomyl (Lannate) / Table Grapes / Redback Spider	19-Feb-18	28-Feb-23	Vitor Marketing
PER11748 Version 2	Sodium Metabisulfite / Table Grapes (packaged) / Phylloxera (QLD only)	17-Sep-09	31-Oct-24	Hort Innovation
PER89241	Spinetoram (Delegate) / Grapes / Fall Armyworm	6-Mar-20	31-Mar-23	Hort Innovation
PER89870	Spinosad (Entrust Organic) / Grapes / Fall Armyworm	21-Jul-20	31-Jul-23	Hort Innovation
PER85499 Version 2	Sulphur Dioxide & Carbon Dioxide / Table Grapes / Redback Spider	28-Nov-17	31-Aug-27	Hort Innovation
PER12439 Version 5	Trichlorfon / Table Grapes / Fruit Fly	30-Aug-11	31-Mar-26	Hort Innovation

Appendix 6. Table Grape Maximum Residue Limits (MRLs)

CODEX commodity groupings of berries and other small fruits and subgroups:

FB 0018	Berries and other small fruits
FB 2008	Small fruit vine climbing
FB 0269	Grapes
FB 1235	Table grapes
	Fruit

Note: Australia is a net exporter of fresh table grapes, with 61% of total production exported in 2020/21. China is our largest import destination, accounting for 35% of total exports for the year ending June 2021. Other major importing companies are Indonesia, Hong Kong, Japan and Philippines. 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
Abamectin	FB 0269	Grapes	0.01	0.03
Acetamiprid	FB 0269	Grapes	0.05	0.5
Aldicarb	FB 0269	Grapes	-	0.2
Amectotradin	FB 0269	Grapes	3	6
Amisulbrom	FB 0269	Grapes	0.5	-
Amitrole	FB 0269	Grapes	*0.01	0.05
Azocyclotin	FB 0269	Grapes	-	0.3
Azoxystrobin	FB 0269	Grapes	2	2
Benalaxyl	FB 0269	Grapes	-	0.3
Benzovindiflupyr	FB 0269	Grapes	-	1
Bifenazate	FB 0269	Grapes {except wine grapes}	T1	-
	FB 0269	Grapes	-	0.7
Bifenthrin	FB 0269	Grapes	*0.01	0.3
Boscalid	FB 0269	Grapes	4	5
Bromide Ion		Fruits	-	20
Buprofezin	FB 0269	Grapes	0.3	1
Captan	FB 0018	Berries and other small fruits	T30	-
	FB 0269	Grapes	10	25
Carbaryl	FB 0269	Grapes	*0.01	-
Carbendazim	FB 0269	Grapes	-	3
Carfentrazone-ethyl	FB 0018	Berries and other small fruits	*0.05	-
	FB 0269	Grapes	*0.05	-
Chlorantraniliprole	FB 0269	Grapes	0.3	-
	FB 0018	Berries and other small fruits	-	1
Chlordane		Fruits & Vegetables	-	E0.02
Chlormequat	FB 0269	Grapes	0.75	0.04
Chlorothalonil	FB 0269	Grapes	10	3
Chlorpyrifos	FB 0269	Grapes	T1	0.5
Chlorpyrifos-Methyl	FB 0269	Grapes	-	1

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Clofentezine	FB 0269	Grapes	-	2
Clothianidin	FB 0269	Grapes {except wine grapes}	3	-
	FB 0269	Grapes	-	0.7
Cyanamid	FB 0269	Grapes	*0.05	-
Cyazofamid	FB 0269	Grapes	-	1.5
Cyclaniliprole	FB 0269	Grapes	-	0.6
Cycloxydim	FB 0269	Grapes	-	0.3
Cyflufenamid	FB 0269	Grapes	0.1	-
Cyflumetofen	FB 0269	Grapes	0.7	0.6
Cyhalothrin	FB 0018	Berries and other small fruits	-	0.2
Cyhexatin	FB 0269	Grapes	-	0.3
Cypermethrins	FB 0269	Grapes	T0.05	0.2
Cyprodinil	FB 0269	Grapes	2	3
2,4-D	FB 0269	Grapes	T*0.05	-
	FB 0018	Berries and other small fruits	-	0.1
DDT		Fruits	E1	-
Deltamethrin	FB 0269	Grapes	-	0.2
Diafenthiuron	FB 0269	Grapes	T2	-
Dichlobenil	FB 0269	Grapes	0.1	0.05
Dichlofluanid	FB 0269	Grapes	0.5	-
Dicofol		Fruits {except Strawberry}	5	-
Difenoconazole	FB 0269	Grapes	2	3
Diflufenican	FB 0269	Grapes	*0.002	-
Dimethomorph	FB 0269	Grapes	2	3
Dinocap	FB 0269	Grapes	-	0.5
Dinotefuran	FB 0269	Grapes	-	0.9
2,2-DPA	FB 0269	Grapes	3	-
Diphenylamine		Fruits {except Apple; Pear}	0.5	-
Diquat		Fruits	*0.05	-
Dithianon		Fruits {except Blueberries}	2	-
	FB 1235	Table grapes	-	2
Dithiocarbamates	FB 0018	Berries and other small fruits {except strawberries}	T15	-
	FB 0269	Grapes	-	5
Emamectin	FB 0269	Grapes	*0.002	0.03
Ethephon	FB 0269	Grapes	10	0.8
Ethion	FB 0269	Grapes	2	-
Etofenprox	FB 0269	Grapes	-	4
Etoxazole	FB 0269	Grapes	0.2	0.5
Famoxadone	FB 0269	Grapes	-	2
Fenamidone	FB 0269	Grapes	-	0.6
Fenbuconazole	FB 0269	Grapes	-	1
Fenbutatin Oxide	FB 0269	Grapes {except wine grapes}	T3	-
	FB 0269	Grapes	-	5
Fenhexamid	FB 0269	Grapes	10	15
Fenitrothion	FB 0269	Grapes	1	-
Fenpyrazamine	FB 1235	Table grapes	2	-
	FB 0269	Grapes	-	3

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Fenpyroximate	FB 0269	Grapes	-	0.1
Fenvalerate	FB 0269	Grapes	0.1	-
Fipronil	FB 0269	Grapes {except wine grapes}	T*0.01	-
Fluazifop-p-butyl	FB 0018	Berries and other small fruits	0.2	-
	FB 0269	Grapes	-	*0.01
Flubendiamide	FB 0269	Grapes	-	2
Fludioxonil	FB 0269	Grapes	2	2
Fluensulfone	FB 2008	Small fruit vine climbing	-	0.7
Flumioxazin	FB 0269	Grapes	*0.01	*0.02
Fluopicolide	FB 0269	Grapes	-	2
Fluopyram	FB 0269	Grapes	0.3	2
Fluoxapiprolin	FB 0269	Grapes	0.15	-
Flupyradifurone	FB 0269	Grapes	-	3
Flusilazole	FB 0269	Grapes	-	0.2
Flutriafol	FB 0269	Grapes	-	0.8
Fluvalinate	FB 1235	Table grapes	0.05	-
Fluxapyroxad	FB 0269	Grapes	-	3
Folpet	FB 0269	Grapes	-	10
Forchlorfenuron	FB 0269	Grapes	*0.01	-
Fosetyl Al	FB 0269	Grapes	-	60
Glufosinate	FB 0018	Berries and other small fruits	0.1	-
	FB 0269	Grapes	-	0.15
Glyphosate	FB 0018	Berries and other small fruits	*0.05	-
Haloxyfop	FB 0018	Berries and other small fruits	*0.05	-
	FB 0269	Grapes	-	*0.02
Hexaconazole	FB 0269	Grapes	0.05	-
Hexythiazox	FB 0269	Grapes	-	1
Imidacloprid	FB 0269	Grapes	-	1
Indoxacarb	FB 0269	Grapes	0.5	2
Iprodione	FB 0269	Grapes	20	10
Isofetamid	FB 2008	Small fruit vine climbing	-	3
Isoxaben	FB 0269	Grapes	0.01	-
Kresoxim-Methyl	FB 0269	Grapes	-	1.5
Lindane	FB 0269	Grapes	E0.5	-
Maldison / Malathion	FB 0269	Grapes	8	5
Mandestrobin	FB 0269	Grapes	-	5
Mandipropamid	FB 0269	Grapes	0.3	2
Mefentriconazole	FB 0269	Grapes	1	-
Meptyldinocap	FB 0269	Grapes	-	0.2
Metaflumizone	FB 0269	Grapes	-	5
Metalaxyl	FB 0269	Grapes	1	1
Methidathion	FB 0269	Grapes	-	1
Methiocarb	FB 0269	Grapes	0.5	-
Methomyl	FB 0269	Grapes	2	0.3
Methoxyfenozide	FB 0269	Grapes	2	1
Metrafenone	FB 0269	Grapes	1	5
Myclobutanil	FB 0269	Grapes	1	0.9
Napropamide	FB 0269	Grapes	*0.01	-

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Norflurazon	FB 0269	Grapes	0.1	-
Oxabetrinil	FB 0269	Grapes	2	-
Oxathiapiprolin	FB 0269	Grapes	-	0.9
Oxyfluorfen	FB 0269	Grapes	0.05	-
Parathion-Methyl	FB 0269	Grapes	-	0.5
Paraquat		Fruits {except Olives}	*0.05	-
	FB 0018	Berries and other small fruits	-	*0.01
Penconazole	FB 0269	Grapes	0.1	0.4
Pendimethalin	FB 0018	Berries and other small fruits	*0.05	-
Permethrin	FB 0269	Grapes	-	2
Phosmet	FB 0269	Grapes	-	10
Phosphine	FB 0018	Berries and other small fruits	T*0.01	-
Phosphorous Acid	FB 0018	Grapes	200	-
Piperonyl Butoxide		Fruits	8	-
Pirimicarb		Fruits {except Blackberries}	0.5	-
Propargite	FB 0269	Grapes	-	7
Propineb	FB 0269	Grapes	20	-
Proquinazid	FB 0269	Grapes	0.5	-
Pydiflumetofen	FB 0269	Grapes	2	-
	FB 2008	Small fruit vine climbing	-	1.5
Pyraclostrobin	FB 0269	Grapes	2	2
Pyrethrins		Fruits	1	-
Pyridaben	FB 0269	Grapes	5	-
Pyrimethanil	FB 0269	Grapes	5	4
Pyriofenone	FB 0269	Grapes	0.5	-
	FB 2008	Small fruit vine climbing	-	0.8
Pyriproxyfen	FB 0269	Grapes	0.02	-
Quinoxyfen	FB 0269	Grapes	0.5	2
Quizalofop-ethyl	FB 0269	Grapes	*0.02	-
Quizalofop-P-tefuryl	FB 0269	Grapes	*0.02	-
Saflufenacil	FB 0269	Grapes	-	0.01
Simazine		Fruits	*0.1	-
Spinetoram	FB 0018	Berries and other small fruits	0.5	-
	FB 0269	Grapes	-	0.3
Spinosad	FB 0269	Grapes	0.5	0.5
Spirodiclofen	FB 0269	Grapes	-	0.2
Spirotetramat	FB 0269	Grapes	0.7	2
Spiroxamine	FB 0269	Grapes	2	-
Sulfoxaflor	FB 0269	Grapes	*0.01	2
Sulphur Dioxide	FB 1235	Table grapes	10	-
Tebuconazole	FB 0269	Grapes	5	6
Tebufenozide	FB 0269	Grapes	2	2
Teflubenzuron	FB 0269	Grapes	-	0.7
Tetraconazole	FB 0269	Grapes	0.5	-
Thiacloprid	FB 0018	Berries and other small fruits	-	1
Thiamethoxam	FB 0018	Berries and other small fruits	-	0.5
Triadimefon	FB 0269	Grapes	1	0.3
Triadimenol	FB 0269	Grapes	0.5	0.3

Chemical	Codex	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Trichlorfon	FB 0018	Berries and other small fruits	T2	-
Trifloxystrobin	FB 0269	Grapes	0.5	3
Trifluralin		Fruits	*0.05	-
Valifenalate	FB 0269	Grapes	-	0.3
Zoxamide	FB 0269	Grapes	-	5

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 28. Prepared 20 August 2022. CODEX MRLs: CODEX Alimentarius International Food Standards database (September 2022), http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/

Appendix 7. Table Grape Agrichemical Regulatory Risk Assessment

Table Grape
Agrichemical Regulatory
Risk Assessment

September 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 so as to ensure compliance, as a MRL breach would adversely affect market access.

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

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

Table Grape 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 OTHER PESTS			
Abamectin	**6**	Fruit flies (PER91073 – SA Biosecurity) Bait spray)	EU: Use restricted to permanent greenhouses
Abamectin + Chlorantraniliprole	**6 + 28**	Garden weevil	Abamectin EU: Use restricted to permanent greenhouses
		Grape leaf rust mite	
		Grapevine moth	
		Lightbrown apple moth	
		Two-spotted mite	
Acetamiprid + Pyriproxyfen	**4A + 7C**	Grapevine scale	Acetamiprid APVMA: Under review EU: Under review
		Lightbrown apple moth	
		Longtailed mealybug	
Alpha-cypermethrin	**3A**	Garden weevil (Non-bearing)	EU: Withdrawal of approval, grace period expires December 2022
		Apple weevil (Non-bearing)	
		Circulio beetle (Non-bearing)	
		Cutworms (Non-bearing)	
Bifenazate (PER14492)	**20D**	Two-spotted mite	Canada: Under review EU: Use restricted to non-edible crops in permanent greenhouses
Bifenthrin	**3A**	Fig longicorn/ trunk borer	Canada: Not authorised EU: Not authorised

Active Constituents	Chemical Group	Problem	Comment
Buprofezin	**16**	Tuber mealybug Longtailed mealybug	EU: MRLs set to limit of quantification
Carbaryl	**1A**	Crickets Cutworms Grasshoppers	Canada: Reviewed, large number of uses deleted Codex: Review scheduled, support uncertain EU: Authorisation not renewed USA: Under review
Chlorantraniliprole	**28**	Grapevine moth Lightbrown apple moth Fall armyworm	
Chlorpyrifos	**1B**	African black beetle Australian plague locust Grapevine moth Grapevine scale Lightbrown apple moth Mealybug Migratory locust Spur-throated locust Tuber mealybug European earwig (PER14868)	APVMA: Under review. Codex: Scheduled for review by JMPR Canada: Cancellation of all uses. EU: No authorisation in place USA: EPA decision to cancel use on food crops
Clothianidin	**4A**	Fruit flies Longtailed mealybug	APVMA: Under review Canada: Field uses cancelled or amended EU: Not authorised USA: Re-registration with new risk mitigation measures
Diazinon	**1B**	Mealybug Australian plague locust	APVMA: Under review EU: No authorisation in place Codex: Withdrawal of Codex MRLs recommended

Active Constituents	Chemical Group	Problem	Comment
Dimethoate	**1B**	Fruit flies (PER13859) After harvest orchard clean-up spray	Codex: MRL deletion recommended. EU: Not authorised
Emamectin benzoate	**6**	Grapevine moth	EU: Candidate for substitution
		Lightbrown apple moth	
		Fall armyworm	
Esfenvalerate	**3A**	Garden weevil	EU: Candidate for substitution
Ethyl formate	**8A**	Longtailed mealybug	EU: No authorisation in place
		Plague thrips	
		Two-spotted mite	
		Western flower thrips	
		Lightbrown apple moth	
		Redback spider	
Etoxazole	**10B**	Two-spotted mite	EU: Use on greenhouse ornamentals only & candidate for substitution
Fenbutatin oxide	**12B**	Grape leaf rust mite (PER13378)	APVMA: nominated for review Codex: To be reviewed by JMPR. No supporting registrant EU: No authorisation in place USA: Under review
		Two-spotted mite (PER13378)	
Fenitrothion	**1B**	Australian plague locust	EU: No authorisation in place
		Migratory locust	
		Small plague grasshopper	
		Spur-throated locust	
		Wingless grasshopper	
Fipronil	**2B**	European wasp (Baits and trap - PER86492 / PER89402 / PER88071)	APVMA: Under review Codex: Re-evaluation scheduled for 2021/22 EU: No authorisation in place USA: Under review
		Termites (PER89329 NT only)	

Active Constituents	Chemical Group	Problem	Comment
Indoxacarb	**22A**	European earwig	Canada: No authorisation EU: Authorisation not renewed. Grace period expires September 2022 UK: Proposed non-renewal
		Garden weevil	
		Inland katydid	
		Wingless grasshopper	
		Grapevine moth	
		Lightbrown apple moth	
		Fall armyworm (PER89278)	
Lambda-cyhalothrin	**3A**	Fruit flies (PER12961 – SA Biosecurity) (Soil drench)	EU: Candidate for substitution
Malathion	**1B**	Fruit flies (cover spray & bait spray)	APVMA: Under review Codex: Re-evaluation scheduled for 2023/24 EU: Restricted use to permanent greenhouses
		Grapevine scale	
		Mealybug	
		Australian plague locust	
		Grapevine moth	
		Migratory locust	
		Spur-throated locust	
Metarhizium anisopliae var. *acridum*	**UNF**	Australian plague locust	
		Grasshoppers	
		Wingless grasshopper	
Methomyl	**1A**	Grapevine hawk moth	APVMA: nominated for review Canada: Re-evaluated with majority of uses removed EU: No authorisations in place USA: Under review
		Grapevine moth	
		Lightbrown apple moth	
		Redback spider (PER85594) Fall armyworm (PER89293)	

Active Constituents	Chemical Group	Problem	Comment
Methoxyfenozide	**18**	Lightbrown apple moth	EU: Proposed restricted authorisation & candidate for substitution
Paraffinic oil/ petroleum oil	**UNM**	European red mite	
		Grape leaf blister mite	
		Grapevine scale	
		Mealybug	
		Scale insects	
		Two-spotted mite	
Pheromone (Tetradecadienyl acetate + Tetradecenyl acetate)		Lightbrown apple moth	
Pyrethrins	**3A**	Aphids	Canada: Under review
		Caterpillars	
		Fruit flies	
		Plague thrips	
		Rutherglen bug	
		Lightbrown apple moth	
Pyridaben	**21A**	Bunch/vine mite	
Pyriproxyfen	**7C**	Grapevine scale (Nursery stock non-bearing)	
Sodium Metabisulfite		Phylloxera	
Spinetoram	**5**	Grapevine moth	
		Lightbrown apple moth	
		Fall armyworm (PER89241)	
Spinosad	**5**	Grapevine moth	
		Lightbrown apple moth	
		Fall armyworm (PER89870)	

Active Constituents	Chemical Group	Problem	Comment
Spirotetramat	**23**	Grapevine scale	
		Longtailed mealybug	
		Northern plague thrips	
		Plague thrips	
		Tuber mealybug	
Sulfoxaflor	**4C**	Longtailed mealybug	USA: Pollinator concerns EU: Restricted to permanent glasshouses only
Sulfur	**UN**	Bunch/vine mite	
		Grape leaf blister mite	
		Grape leaf rust mite	
Sulphur Dioxide & Carbon Dioxide	**UN**	Redback spider (PER85499)	
Tau-fluvalinate	**3A**	Plague thrips	
Tebufenozide	**18**	Lightbrown apple moth	
Trichlorfon	**1B**	Grapevine moth	APVMA: nominated for review Codex: No MRLs EU: No authorisations USA: No MRLs
		Fruit flies (PER12439)	
OTHER PESTS			
Copper complex		Slugs and snails	
Iron-EDTA complex / Mineral iron		Slugs and snails	
Metaldehyde		Slugs and snails	
Methiocarb		Slugs and snails	

Active constituent	Chemical Group	Disease/Problem	Comment
DISEASES			
Ametoctradin + dimethomorph	**45 + 40**	Downy mildew	Dimethomorph EU: Under review
Amisulbrom + Copper	**21 + M1**	Downy mildew	Copper EU: Candidates for substitution
Aureobasidium pullulans	**-**	Botrytis rot / Grey mould	
Azoxystrobin	**11**	Botrytis rot / Grey mould Downy mildew Powdery mildew	Canada: Review proposed
Azoxystrobin + Dimethomorph	**11 + 40**	Downy mildew	Dimethomorph EU: Under review
Azoxystrobin + Tebuconazole	**11 + 3**	Botrytis rot /Grey mould Downy mildew Powdery mildew	Tebuconazole APVMA: nominated for review Canada: Under review EU: Candidate for substitution USA: Under review
Bacillus amyloliquefaciens	**44**	Botrytis rot / Grey mould	
Boscalid	**7**	Botrytis rot / Grey mould Powdery mildew	Canada: Under review
Captan	**M4**	Black spot / Anthracnose Botrytis rot / Grey mould Downy mildew Phomopsis cane & leaf spot	EU: Under review proposed restriction to use in permanent greenhouses only USA: Under review
Chlorothalonil	**M5**	Botrytis rot / Grey mould Downy mildew Black spot / Anthracnose	APVMA: nominated for review Canada: Proposed cancellation of uses EU: No authorisation in place USA: Under review

Active constituent	Chemical Group	Disease/Problem	Comment
Copper	**M1**	Black spot/Anthracnose	EU: Candidate for substitution
		Downy mildew	
		Phomopsis cane & leaf spot	
		Powdery mildew	
Cyflufenamid	**U6**	Powdery mildew	
Cyproconazole	**3**	Eutypa dieback	APVMA: nominated for review EU: No authorisation in place
Cyprodinil + Fludioxonil	**9 + 12**	Botrytis rot / Grey mould	Cyprodinil Canada: Under review EU: Candidate for substitution Fludioxonil EU: Under review, & candidate for substitution
Difenoconazole	**3**	Powdery mildew	APVMA: nominated for review EU: Candidate for substitution USA: Under review
Dimethomorph	**40**	Downy mildew	
Dithianon	**M9**	Black spot / Anthracnose	EU: Restricted use to non-edible crops
		Downy Mildew	
		Phomopsis cane & leaf spot	
Fenhexamid	**17**	Botrytis rot / Grey mould	
Fenpyrazamine	**17**	Botrytis rot / Grey mould	
Fluazinam	**29**	Eutypa dieback	Canada: Under review
		Phomopsis cane & leaf spot	
Fludioxonil + Pydiflumetofen	**12 + 7**	Botrytis rot / Grey mould	Fludioxonil EU: Under review & Candidate for substitution
		Powdery mildew	
Fluopyram + Tebuconazole	**7 + 3**	Botrytis rot / Grey mould	Tebuconazole APVMA: nominated for review Canada: Under review EU: Candidate for substitution USA: Under review
		Powdery mildew	

Active constituent	Chemical Group	Disease/Problem	Comment
Hydrogen peroxide + Peroxyacetic acid	**M**	Downy mildew	
		Powdery mildew	
Iodocarb	**28**	Eutypa dieback	EU: Not authorised
Iprodione	**2**	Botrytis rot / Grey mould	Canada: Majority of food crop uses deleted Codex: Review scheduled EU: No authorisation in place
Mancozeb	**M3**	Black spot / Anthracnose	APVMA: nominated for review Canada: Many uses cancelled Codex: To be reviewed 2023/24 EU: Authorisation not renewed
		Downy mildew	
		Phomopsis cane & leaf spot	
		Powdery mildew	
Mandipropamid	**40**	Downy mildew	
Mefentrifluconazole	**3**	Powdery mildew	
Metalaxyl/ Metalaxyl-M	**4**	Downy mildew	Metalaxyl EU: Candidate for substitution Metalaxyl-M EU: Restricted use approval
Metiram	**M3**	Black spot / Anthracnose	APVMA: nominated for review Canada: All foliar uses, other than potato cancelled Codex: To be reviewed 2023/24 EU: Under review
		Downy mildew	
		Phomopsis cane & leaf spot	
Metrafenone	**U8**	Powdery mildew	
Myclobutanil	**3**	Powdery mildew	APVMA: nominated for review EU: No authorisation in place
Oxadixyl	**4**	Downy mildew	EU: No authorisation in place
Penconazole	**3**	Powdery mildew	APVMA: nominated for review
Phosphonic acid	**33**	Downy mildew	
Plant oils (eugenol, geraniol, thymol)		Botrytis rot / Grey mould	

Active constituent	Chemical Group	Disease/Problem	Comment
Polyoxin-D	**19**	Botrytis rot / Grey mould	EU: No authorisation in place
		Powdery mildew	
Potassium bicarbonate	**M2**	Downy mildew	EU: No authorisation in place
		Powdery mildew	
Propineb	**M3**	Downy mildew	APVMA: nominated for review EU: No authorisation in place Codex: To be reviewed 2023/24
Proquinazid	**13**	Powdery mildew	
Pydiflumetofen	**7**	Powdery mildew	
Pyraclostrobin	**11**	Downy mildew	
		Powdery mildew	
Pyrimethanil	**9**	Botrytis rot / Grey mould	Canada: Under review
Pyriofenone	**U8**	Powdery mildew	
Quinoxyfen	**13**	Powdery mildew	EU: No authorisations
Sodium metabisulfite	**M**	Botrytis rot / Grey mould	
		Storage rots (post-harvest)	
Spiroxamine	**5**	Powdery mildew	
Sulfur	**M2**	Powdery mildew	
Tebuconazole	**3**	Botryosphaeria dieback	Tebuconazole APVMA: nominated for review Canada: Under review EU: Candidate for substitution USA: Under review
		Eutypa dieback	
		Powdery mildew	
Tetraconazole	**3**	Powdery mildew	APVMA: nominated for review
Thiram	**M3**	Black spot / Anthracnose	APVMA: nominated for review Canada: Cancelled all foliar uses Codex: To be reviewed 2023/24 Europe: No authorisation in place
Triadimefon	**3**	Powdery mildew	APVMA: nominated for review EU: No authorisation in place USA: Under review. Proposed use restrictions on turf and ornamentals

Active constituent	Chemical Group	Disease/Problem	Comment
Triadimenol	**3**	Powdery mildew	APVMA: nominated for review Canada: No authorisation in place EU: No authorisation in place USA: Registration cancelled
Trichoderma harzianum	**BM2**	Eutypa dieback	
Trifloxystrobin	**11**	Downy mildew	Canada: Under review
		Powdery mildew	
Zineb	**M3**	Downy mildew	APVMA: nominated for review Codex: To be reviewed 2023/24 EU: No authorisation in place
Ziram	**M3**	Black spot/Anthracnose	APVMA: nominated for review Canada: Cancelling of all uses Codex: To be reviewed 2023/24 EU: Candidate for substitution

Active Constituents	Chemical Group	Comment
WEEDS		
Amitrole	**34**	APVMA: nominated for review EU: No authorisation in place
Carfentrazone-ethyl	**14**	
Dichlobenil	**29**	EU: No authorisation in place
Diquat	**22**	APVMA: Currently under review EU: No authorisation in place
Fluazifop	**1**	
Flumioxazin	**14**	EU: Candidate for substitution
Glufosinate	**10**	Canada: Review proposed EU: No authorisation in place
Glyphosate	**9**	Ongoing issues internationally EU: Under review
Haloxyfop-P	**1**	EU: Not authorised
Isoxaben	**29**	
Norflurazon	**12**	EU: No authorisation in place
Oryzalin	**3**	EU: No authorisation in place
Oxyfluorfen	**14**	EU: Candidate for substitution
Paraquat	**22**	APVMA: Currently under review Canada: Review initiated EU: Not authorised Rotterdam Convention: nominated
Pendimethalin	**5**	EU: Candidate for substitution
Quizalofop-P	**1**	Canada: Under re-evaluation EU: Candidate for substitution
Simazine	**5**	APVMA: nominated for review EU: No authorisation in place
Trifluralin	**3**	EU: No authorisation in place

Active Constituents	Chemical Group	Comment
PLANT GROWTH REGULATORS		
Calcium nitrate (PER86553)		
Chlormequat		
Cyanamide		EU: No authorisation in place
Ethephon (PER87879)		
Gibberellic acid		
Forchlorfenuron		
S-abscisic acid		

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