



Olives

Strategic Agrichemical Review Process
(SARP)

December 2020

Hort Innovation
Project – MT19008

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

Date of report:

December 2020

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Innovation**
Strategic levy investment

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1. Summary

The strategic levy investment project Strategic Agrichemical Review Process (SARP) - Updates (MT19008) is part of the Hort Innovation Olive Fund. A Strategic Agrichemical Review Process (SARP), through the process of a desktop audit and industry liaison;

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

Alternative pesticides should ideally be selected for benefits of:

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

The results of this process will provide the olive 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 are no diseases rated as a high priority. Those rated as a moderate priority are:

Common name	Scientific name
Anthraxnose	<i>Colletotrichum</i> spp.
Cercospora Leaf Mould (Olive Leaf Spot or Cercosporiosis)	<i>Cercospora cladosporioides</i> / <i>Pseudocercospora cladosporioides</i>
Olive Peacock Spot (Olive Leaf Spot)	<i>Spilocaea oleagina</i>
Olive Knot	<i>Pseudomonas savastanoi</i>
Verticillium Wilt	<i>Verticillium dahliae</i>

1.2 Insects, mites and other pests

There are no insects, mites and other pests rated as a high priority. Those rated as a moderate priority are:

Common name	Scientific name
Olive Lace Bug	<i>Froggattia olivina</i>
Black Scale	<i>Saissetia oleae</i>

1.3 Weeds

The high priority weeds are:

Common name	Scientific name
Flaxleaf Fleabane	<i>Conyza bonariensis</i>

2. The Australian Olive Industry

Olives are grown in many states in Australia, with most production being grown in Victoria. Almost all olives grown in Australia are used for the production of olive oil.

Production for the year ending June 2019 was 125,000 tonnes of fresh olives, of which 118,750 tonnes (95%) were extracted for oil. Oil production was 19,736 tonnes or 21.6 million litres. The value of production was \$155 m while the wholesale value of the oil supply was \$324 m and the wholesale value of the table supply was \$101 m.

Olive production fluctuates depending on water availability in key growing regions. Australia is a net importer of olive oil and the level of imports is increasing as consumer demand grows and dry conditions impact on yields in Australia.

Table 1 Fresh Olive Production - Seasonality by State¹

State	18/19 Tonnes	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
New South Wales	10,750												
Victoria	86,438												
Queensland	900												
Western Australia	13,125												
South Australia	13,625												
Tasmania	163												
Availability Legend			High		Medium		Low					None	

Australia exported about 12% of total olive oil production in 2018/19. The major export markets are United States, Europe and China. Export volumes have been declining in recent years.

¹ Hort Innovation (2020). Australian Horticulture Statistics Handbook 2018/19. [online] Available at: <https://www.horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/australian-horticulture-statistics-handbook/>

3. Introduction

3.1 Background

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

Growers may face severe losses from diseases, pests and weeds due to a lack of registered or approved (via a permit) chemical control tools.

Environmental concerns, consumer demands, and public opinion are also significant influences in the marketplace related to pest management practices. Industry IPM practitioners must strive to implement best management practices and tools to incorporate a pest management regime where strategies work in harmony with each other to achieve the desired effects while posing the least risks.

In combination with cultural practices, pesticides are important tools in olive 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 olive industry regarding pesticide access, Hort Innovation undertook a review of the pesticide requirements via a Strategic Agrichemical Review Process (SARP) in 2014. The current project is to update the SARP with the latest information and progress.

The SARP process identifies diseases, insect pests and weeds of major concern to the olive 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 olive 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 olives but attempts to prioritise the major problems.

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

For more information visit: <https://www.planthealthaustralia.com.au/industries/Olives/>

3.2 Minor use permits and registration

From a pesticide access perspective, the APVMA classifies olives as a minor crop.

This classification assists the industry to pursue access to minor use permits.

Table Olives fit within the APVMA Crop Group 005: Assorted Tropical and Sub-Tropical Fruits – edible peel, Subgroup 005A, Assorted Tropical and Sub-Tropical Fruits, edible peel - small.

Olives produced for olive oil also fit within the APVMA Crop Group 023: Oilseed, and Subgroup 023D, Oil fruits.

Justification for future minor use 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 olive industry is for manufacturers to register new pesticides uses in the crop.

3.3 Methods

The current update of the Olive Strategic Agrichemical Review Process (SARP), which was last updated in 2014, was conducted by desktop audit and included an online industry survey. The process included gathering, collating and confirming information. The steps in the process were:

Process of Review	Activity / Date
Industry survey	Preparation and circulation of online industry survey to update priority pests and identify priority control gaps. Survey released: 14 January 2020 Survey closed: 31 March 2020
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 MT17019
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 olives
- Appendix 2. Products available for control of insects, mites and other pests in olives
- Appendix 3. Products available for weed control in olives
- Appendix 4. Current permits for use in olives
- Appendix 5. Olive Maximum Residue Limits (MRLs)
- Appendix 6. Olive Agrichemical Regulatory Risk Assessment

4. Diseases, pests and weeds of olives

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

Information on regulatory risk derived from project MT17019 (Chapter 4) - Regulatory support and coordination (Appendix 6) has been incorporated.

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

4.1 Diseases of Olives

4.1.1 Disease priorities

Common name	Scientific name
Moderate	
Anthracnose	<i>Colletotrichum</i> spp.
Cercospora Leaf Mould (Olive Leaf Spot or Cercosporiosis)	<i>Cercospora cladosporioides</i> / <i>Pseudocercospora cladosporioides</i>
Olive Peacock Spot (Olive Leaf Spot)	<i>Spilocoaea oleagina</i>
Olive Knot	<i>Pseudomonas savastanoi</i>
Verticillium Wilt	<i>Verticillium dahliae</i>
Low	
Apical End Desiccation / Soft Nose (physiological disorder)	
Phytophthora Root Rot	<i>Phytophthora</i> spp.
Pythium Root Rot	<i>Pythium</i> spp.
Rhizoctonia Root Rot	<i>Rhizoctonia</i> spp.
Bacterial Stem Cankers and Dieback	<i>Pseudomonas syringae</i> , <i>Xanthomonas campestris</i> , <i>Ralstonia solanacearum</i>
Fruit Rots	<i>Botryosphaeria</i> spp., <i>Alternaria</i> spp., <i>Coleophoma oleae</i>
Charcoal Root Rot	<i>Macrophomina phaseolina</i>
Stem Cankers	<i>Botryosphaeria</i> spp.
Fusarium Root Rot	<i>Fusarium</i> spp.
Green and Blue Moulds	<i>Penicillium</i> spp.

The disease priorities nominated through the industry survey are similar to the last Olive SARP in 2015. Anthracnose is rated as a moderate priority. It is a widespread disease that causes fruit quality issues for both oil production and table olives. Pursuing additional fungicides with novel modes of action is a priority for the olive industry.

Other diseases ranked as a moderate priority are Cercospora Leaf Mould, Peacock Spot, Olive Knot and Verticillium Wilt. Control options are limited for these diseases and there is a high reliance on copper for the key foliar diseases, Anthracnose, Cercospora and Peacock Spot. Cultural practices such as canopy management, timely pruning of diseased plant material and maintaining good soil drainage will assist in the management of these diseases.

In managing fungal and bacterial diseases, the industry should be mindful of resistance management. CropLife Australia has a resistance management strategy and users should refer to it before using any product².

² <https://www.croplife.org.au/resources/programs/resistance-management/fungicide-resistance-management-strategies1/fungicide-resistance-management-strategies1-draft/>

CropLife Australia recommends that in the absence of a specific resistance management strategy the use of fungicides from a specific mode of action be limited to a maximum of one-third of the total. The number of consecutive applications of the same group should also be limited by rotating/alternating between products from different activity groups. An exception is the use of Group M fungicides as they have a low risk of resistance development.

4.1.2 Available and potential products for priority diseases

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

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

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Anthracnose (<i>Colletotrichum</i> spp.)							
Priority: Moderate							
Rated as a moderate priority in VIC, NSW and WA, and as a high priority in SA. Fruit can be infected any time from flowering onwards, but symptoms do not usually become visible until the fruit begins to ripen. A planned protectant fungicide program should be used from pre-flowering through to harvest to reduce infections.							
Azoxystrobin (Amistar)	11	Protectant & Curative	21	A	ALL	Registered in olives for control of Anthracnose . Apply prior to the onset of conditions conducive to the disease. Depending on the growing region and the season, generally application should commence just prior to flowering and a second application can be used just after fruit set. Allow a minimum of 21 days between consecutive applications. Do not sure more than 2 applications per season.	-
Copper (Cu) present as copper oxychloride	M1	Protectant	1	A	ALL	Registered in olives for control of Peacock Spot, Grey Leaf Spot, Fruit Round Spot, Anthracnose and Other General Fruit Rot. Apply in autumn before winter rain and again as fruit colour changes. Treatments per season not limited.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Copper (Cu) Present as Cupric Hydroxide Copper (Cu) present as cuprous oxide Copper (Cu) Present as Tribasic Copper Sulphate PER11360	M1	Protectant	1	A	ALL (excl. VIC)	Permitted in olives for control of Peacock Spot and Anthracnose . Apply in autumn before winter rain and again as fruit colour changes. Treatments per season not limited.	-
Mancozeb (Dithane) PER88358	M3	Protectant	14	A	ALL	Permitted in olives for control of Anthracnose . Apply the treatment preferably before the disease infects the trees. This will depend upon whether the olive grove is in a susceptible area (eg summer rains), and the season (unseasonal humid and moist conditions). Treatments should be applied at pruning (June/July), before flowering (October/November) and early fruit set (December/January). Do not use more than 4 applications per season and do not apply less than 14 days after the initial treatment.	R2
Metiram + Pyraclostrobin (Aero)	M3+11	Protectant & Curative	H:21 NG	A	ALL (excl. VIC)	Permitted in olives for control of Anthracnose . Apply prior to the onset of conditions conducive to the disease. Depending on the growing region and the season, generally application should commence just prior to flowering and a second application can be used just after fruit set. Apply a maximum of 2 foliar applications per season, using a minimum 21 day interval between consecutive sprays.	R2
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Hort Innovation Project ST16006 (AgVet grant) generating data to enable a label extension for control of Anthracnose in olives.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of Anthracnose in various crops. Hort Innovation Project ST16006 (AgVet grant) generating data for Luna Experience & Luna Sensation to enable a label extension for control of Anthracnose in olives.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Bacillus amyloliquefaciens</i> (strain QST 713) (Serenade Opti) Bayer	BM02	Biological / Protectant		P		Registered for control of Anthracnose in avocados and mangoes. No MRLs required for biological product.	-
Florypicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed for AU with activity on Powdery Mildew, <i>Botrytis</i> spp., <i>Septoria</i> spp., Anthracnose , <i>Alternaria</i> spp., Scab, <i>Monilinia</i> spp. and <i>Mycosphaerella</i> spp. Due for registration in 2023.	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. US registration for control of Anthracnose in citrus, corn and tuberous and corm vegetables.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registration pending in Australia for control of Botrytis, Alternaria, Powdery Mildew & Anthracnose in berries. Registered in the US for control of Anthracnose in various crops.	R3
Cercospora Leaf Mould / Olive Leaf Spot or Cercosporiosis (<i>Cercospora cladosporioides</i> / <i>Pseudocercospora cladosporioides</i>)							
Priority: Moderate							
Rated as a high priority in SA, a moderate priority in NSW, and a low priority in VIC and WA. Can cause significant leaf drop and fruit damage under warm, humid conditions. Cultural controls have been successful in controlling husk spot, which is a closely related disease in macadamias. An example has been the use of a mechanical tree shaker to prevent husk spot without the need for fungicides.							
Copper (Cu) present as copper oxychloride	M1	Protectant	1	A	ALL	Registered in olives for control of Peacock Spot, Grey Leaf Spot , Fruit Round Spot, Anthracnose and Other General Fruit Rot. Apply in autumn before winter rain and again as fruit colour changes. Treatments per season not limited.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Hort Innovation Project ST16006 (AgVet grant) generating data to enable a label extension for control of Anthracnose in olives. May have activity on Cercospora.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of various leaf diseases in almonds, pome fruit, stone fruit and tropical and sub-tropical fruit (inedible peel). Also with activity on Cercospora.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Azoxystrobin + Difenoconazole (Amistar Top) Syngenta	3+11	Protectant & Curative		P		Registered for control of Leaf Blight (<i>Alternaria</i> and <i>Cercospora</i>) in carrots, and various leaf diseases in potatoes and carrots. Azoxystrobin: AU MRL T2 mg/kg. Difenoconazole: Codex MRL 2 mg/kg (table olives).	-
<i>Bacillus amyloliquefaciens</i> (strain QST 713) (Serenade Opti) Bayer	BM02	Biological / Protectant		P		Registered for control of various leaf diseases in avocado, fruiting vegetables, grapes, mango and strawberry. No MRLs required for biological product.	-
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed for AU with activity on Powdery Mildew, <i>Botrytis</i> spp., <i>Septoria</i> spp., Anthracnose, <i>Alternaria</i> spp., Scab, <i>Monilinia</i> spp. and <i>Mycosphaerella</i> spp. Due for registration in 2023.	-
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered in almonds for control of Black Spot (<i>Colletotrichum</i> spp.), <i>Alternaria</i> , Brown Rot, Nut Scab and Shot Hole, and control of Brown Rot in cherries and Husk Spot in macadamia. Pyraclostrobin: AU MRLs: T3 mg/kg (olive oil – crude); T0.3 mg/kg (olives for oil production); T0.3 mg/kg (table olives). Codex MRLs: 0.01 mg/kg (olives for oil production); 0.01 mg/kg (table olives); 0.07 mg/kg (olive oil – virgin).	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. US registration for control of Cercospora in corn, legume vegetables, peanuts, sorghum, millet, soybean and sugar beet.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registration pending in Australia for control of Botrytis, <i>Alternaria</i> , Powdery Mildew & Anthracnose in berries. US registration for control of Cercospora in brassicas, carrots, cucurbits, stalk vegetables and root and tuber vegetables.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Olive Peacock Spot / Olive Leaf Spot (<i>Spilocaea oleagina</i>)							
Priority: Moderate							
Rated as a moderate priority in SA and NSW, and a low priority in VIC and WA. Peacock Spot causes leaf spots that can grow and merge together. Most infected leaves will fall prematurely by summer. Strategically timed copper sprays have been the major option for protecting against infections.							
Copper (Cu) present as copper oxychloride	M1	Protectant	1	A	ALL	Registered in olives for control of Peacock Spot , Grey Leaf Spot, Fruit Round Spot, Anthracnose and Other General Fruit Rot. Apply in autumn before winter rain and again as fruit colour changes. Treatments per season not limited.	-
Copper (Cu) Present as Cupric Hydroxide Copper (Cu) present as cuprous oxide Copper (Cu) Present as Tribasic Copper Sulphate PER11360	M1	Protectant	1	A	ALL (excl. VIC)	Permitted in olives for control of Peacock Spot and Anthracnose. Apply in autumn before winter rain and again as fruit colour changes. Treatments per season not limited.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative		P		Hort Innovation Project ST16006 (AgVet grant) generating data to enable a label extension for control of Anthracnose in olives. Activity on Peacock Spot unknown.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative		P		Registered for control of various leaf diseases in almonds, pome fruit, stone fruit and tropical and sub-tropical fruit (inedible peel). Activity on Peacock Spot unknown.	-
<i>Bacillus amyloliquefaciens</i> (strain QST 713) (Serenade Opti) Bayer	BM02	Biological / Protectant		P		Registered for control of various leaf diseases in avocado, fruiting vegetables, grapes, mango and strawberry. Activity on Peacock Spot unknown. No MRLs required for biological product.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Florylpicoxamid (Adavelt) Corteva	21	Protectant & Curative		P		New Mode of Action fungicide being developed for AU with activity on Powdery Mildew, <i>Botrytis</i> spp., <i>Septoria</i> spp., Anthracnose, <i>Alternaria</i> spp., Scab, <i>Monilinia</i> spp. and <i>Mycosphaerella</i> spp. Activity on Peacock Spot unknown. Due for registration in 2023.	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative		P		Registered for control of Black Spot in apples and Powdery Mildew in grapes. Activity on Peacock Spot unknown.	-
Olive Knot (<i>Pseudomonas savastanoi</i>)							
Priority: Moderate							
Rated as a moderate priority in VIC and SA, and a low priority in NSW and WA. Olive Knot causes tumours or galls to form on trees, usually on stems and branches. Wounds caused by harvesting, pruning or weather events can provide an entry point for the pathogen. There are no control options available and management relies on farm hygiene and preventing infection entry points.							
Copper	M1	Protectant	1	P-A	ALL	Registered in olives for control of Peacock Spot, Grey Leaf Spot, Fruit Round Spot, Anthracnose and other General Fruit Rot. Registered for control of Phytophthora Stem Cankers in various crops. Activity on Olive Knot unknown.	-
Verticillium Wilt (<i>Verticillium dahliae</i>)							
Priority: Moderate							
Rated as a moderate priority in VIC and SA, and a low priority in NSW and WA. Verticillium Wilt is a soil-borne disease that can lead to tree death and is untreatable once infection has occurred. Infected trees and limbs should be removed and mulched immediately to prevent spread within the orchard.							
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime) Bayer	BM02	Biological	NR	P-A	ALL	Registered in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Provides suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-
Apical End Desiccation / Soft Nose (physiological disorder)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Apical End Desiccation results in the apical end of the fruit shrivelling as it approaches maturity. It can also cause the internal flesh and pip to be blackened. Cause is uncertain. Maintaining good crop nutrition and irrigation management will assist but it may occur with sudden changes in temperature and humidity which are more difficult to manage for.							
No control options available.							

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Phytophthora Root Rot (<i>Phytophthora</i> spp.)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Phytophthora Root Rot is a soil-borne disease that is favoured by waterlogged conditions. Cultural controls including drainage measures and managing irrigation to avoid extremes in soil moisture levels will assist in reducing the risk of Phytophthora Root Rot.							
<i>Bacillus amyloliquifaciens</i> Strain QST 713 (Serenade Prime) Bayer	BM02	Biological	NR	P-A	ALL	Registered in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Provides suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-
Mandipropamid (Revus) Syngenta	40	Protectant & Curative		P		Registered for control of Downy Mildew in grapes, lettuce, leafy vegetables and oilseed poppies. US registration for control of Phytophthora in various crops, including as a foliar application for protection of citrus from Phytophthora Root Rot.	-
Metalaxyl-M (Ridomil Gold 25G) Syngenta	4	Protectant & Curative		P		Registered for control of Phytophthora Root Rot in avocado and macadamia.	-
Oxathiapiprolin (Zorvec Enicade) Corteva	49	Protectant & Curative		P		Registered for control of Downy Mildew in bulb vegetables, brassicas, cucurbits, leafy vegetables and poppies. US registration for control of Phytophthora Canker and Brown Rot in citrus.	-
Phosphorous Acid	33	Protectant & Curative		P		Registered for control of Phytophthora Root Rot in various crops, including avocados, macadamias and citrus.	-
Pythium Root Rot (<i>Pythium</i> spp.)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a high priority in SA. Pythium Root Rot is a soil-borne disease which can impact new established trees in poorly drained sites.							
<i>Bacillus amyloliquifaciens</i> Strain QST 713 (Serenade Prime) Bayer	BM02	Biological	NR	P-A	ALL	Registered in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Provides suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Rhizoctonia Root Rot (<i>Rhizoctonia</i> spp.)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Rhizoctonia Root Rot is a soil-borne disease which can impact new established trees in poorly drained sites.							
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime)	BM02	Biological	NR	P-A	ALL	Registered in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Provides suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-
Bacterial Stem Cankers and Dieback (<i>Pseudomonas syringae</i> , <i>Xanthomonas campestris</i> , <i>Ralstonia solanacearum</i>)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Infection occurs through wound entry points and can be transmitted by wind, water and soil.							
<i>Bacillus amyloliquefaciens</i> (strain QST 713) (Serenade Opti) Bayer	BM02	Biological / Protectant		P		Registered for suppression of Bacterial Spot in fruiting vegetables. No MRLs required for biological product.	-
Fruit Rots (<i>Botryosphaeria</i> spp., <i>Alternaria</i> spp., <i>Coleophoma oleae</i>)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Fruit damaged by weather or mechanical means can be susceptible to infection. Anthracnose can also provide a source of infection if not effectively controlled in crop. Post-Harvest sanitation is an important measure to control infections.							
Bromo Chloro Dimethyl Hydatoion (BCDMH)		Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered as a post-harvest treatment for external rot causing organisms. Post-harvest spray or dip. Minimum contact time 60 seconds. Can also be used as a general disinfectant for equipment.	-
Chlorine		Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered as a post-harvest treatment for bacteria and fungi. Post-harvest spray. Must make contact with the fruit for at least 30 seconds. Can also be used as a general disinfectant for equipment.	-
Copper (Cu) present as copper oxychloride	M1	Protectant	1	A	ALL	Registered in olives for control of Peacock Spot, Grey Leaf Spot, Fruit Round Spot, Anthracnose and Other General Fruit Rot . Apply in autumn before winter rain and again as fruit colour changes. Treatments per season not limited.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Peroxyacetic Acid		Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered as a post-harvest treatment for bacteria. Post-harvest spray or dip. Ensure a minimum of 45 seconds contact time.	-
Fludioxonil + Azoxystrobin (Graduate A+) Syngenta	12+11	Protectant / Post-harvest treatment		P		Registered for control of Side Rot and Stem End Rots in avocado. Azoxystrobin: AU MRL T2 mg/kg.	-
Charcoal Root Rot (<i>Macrophomina phaseolina</i>)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Charcoal Rot is a soil-borne disease with low incidence in Australia.							
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime) Bayer	BM02	Biological	NR	P-A	ALL	Registered in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Provides suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-
Stem Cankers (<i>Botryosphaeria</i> spp.)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Occasionally found on tree branches, causing yellowing of foliage above the affected area. Avoidance of pruning wounds and removal of affected wood are the only control measures available.							
No control options available.							
Fusarium Root Rot (<i>Fusarium</i> spp.)							
Priority: Low							
Rated as a low priority in VIC, NSW and WA, and a moderate priority in SA. Fusarium Root Rot is a soil-borne disease with low incidence in Australia. The pathogen can remain in the soil for many years so emphasis should be on ensuring that infected material is not admitted to the farm.							
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime) Bayer	BM02	Biological	NR	P-A	ALL	Registered in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Provides suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Green and Blue Moulds (<i>Penicillium</i> spp.)							
Priority: Low							
Rated as a low priority in all regions. Green and Blue Moulds can cause spoilage of table olives by affecting appearance and producing mycotoxins which make them unsafe to eat. Post-Harvest treatments will protect fruit from infection.							
Bromo Chloro Dimethyl Hydatoin (BCDMH)		Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered as a post-harvest treatment for external rot causing organisms. Post-harvest spray or dip. Minimum contact time 60 seconds. Can also be used as a general disinfectant for equipment.	-
Chlorine		Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered as a post-harvest treatment for bacteria and fungi. Post-harvest spray. Must make contact with the fruit for at least 30 seconds. Can also be used as a general disinfectant for equipment.	-
Copper (Cu) present as copper oxychloride	M1	Protectant	1	A	ALL	Registered in olives for control of Peacock Spot, Grey Leaf Spot, Fruit Round Spot, Anthracnose and Other General Fruit Rot . Apply in autumn before winter rain and again as fruit colour changes. Treatments per season not limited.	-
Peroxyacetic Acid		Sanitiser / Post-Harvest Treatment	NR	A	ALL	Registered as a post-harvest treatment for bacteria. Post-harvest spray or dip. Ensure a minimum of 45 seconds contact time.	-

4.2 Insect, mite, and other pests of olives

4.2.1 Insect, mite, and other pest priorities

Common name	Scientific name
Moderate	
Olive Lace Bug	<i>Froggattia olivinia</i>
Black Scale	<i>Saissetia oleae</i>
Low	
Curculio Beetle / Apple Weevil	<i>Otiorhynchus cribricollis</i>
Armoured Scales	<i>Hemiptera: Diaspididae</i>
Olive Bud Mite	<i>Oxycenus maxwelli</i>
Plague Thrips	<i>Thrips imaginis</i>
Western Flower Thrips	<i>Frankliniella occidentalis</i>
Rutherglen Bug	<i>Nysius vinitor</i>
Olive Fruit Caterpillar	<i>Cryptoblabes</i> spp.
Garden Weevil	<i>Phlyctinus callosus</i>
Root Knot Nematode	<i>Meloidogyne</i> spp.
Citrus Nematode	<i>Tylenchulus semipenetrans</i>
Root Lesion Nematode	<i>Pratylenchus</i> spp.
African Black Beetle	<i>Heteronychus arator</i>
Australian Plague Locusts	<i>Chortoicetes terminifera</i>
Spur-Throated Locust	<i>Austracris guttulosa</i>
Migratory Locust	<i>Locusta migratoria</i>
Wingless Grasshopper	<i>Phaulacridium vittatum</i>
Queensland Fruit Fly	<i>Bactrocera tryoni</i>
Mediterranean Fruit fly	<i>Ceratitis capitata</i>
Green Vegetable Bug	<i>Nezara viridula</i>
Light Brown Apple Moth	<i>Epiphyas postvittana</i>
Cicadas	<i>Cicadidae</i>
Cutworms	<i>Agrostis</i> spp.
Slugs and Snails	<i>Gastropoda</i>
Green Tree Ant	<i>Oecophylla smaragdina</i>

Exotic pests and new incursions which could be potential threats are listed below.

Common name	Scientific name
Fall Armyworm	<i>Spodoptera frugiperda</i>

The priorities for insects, mites and other pests are similar to those listed in the last Olives SARP in 2015. None were rated as a high priority. Olive Lace Bug and Black Scale are rated as a moderate priority.

It is important to take an Integrated Pest Management (IPM) Approach to pest control in olives. A planned, strategic approach is required, and a range of control measures should be used, including cultural controls, biological controls and insecticides. Beneficial insects such as predators, parasitoids and pollinators should be encouraged and can be introduced artificially if required. Insecticide choice should be made with regard to preserving the beneficial insects that play an important role in the crop.

Insecticide choice should include careful planning with resistance management. Pest strategies are available on the CropLife website³.

³ <https://www.croplife.org.au/resources/programs/resistance-management/>

4.2.2 Available and potential products for priority insects, mites and other pests

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

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

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Olive Lace Bug (<i>Froggattia olivinia</i>)								
Priority: Moderate								
Rated as a high priority in NSW, moderate priority in SA and low priority in VIC and NSW. Olive Lace Bug is a widespread pest that feeds on the underside of leaves. Severe infestations can cause significant defoliation of trees leading to reduced fruit yield. Can be present throughout the whole growing season and controls should be used as indicated by pest incidence.								
Clothianidin (Samurai) Sumitomo PER14897	4A	Contact & Ingestion	H:56 NG	A	ALL (excl. VIC)	Permitted in olives for control of Olive Lace Bug . Apply 1 foliar spray when insects are first noticed and whilst still at the nymphal stage. Spring is the most effective time to control this pest. As eggs cannot be seen, monitor trees carefully to observe first nymphal instars. This will occur early September in the northern areas of Australia to early October in the southern areas. For maximum impact, apply just before the oldest nymphs develop wings (approximately 10 days after hatching).	M Bee VH	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Dimethoate PER13999	1B	Contact	H:42 NG	A	ALL	<p>Permitted in olives for control of Olive Lace Bug, Green Vegetable Bug and Rutherglen Bug.</p> <p><u>Spring treatment</u> Spring is the most effective time to control this pest. As eggs cannot be seen, monitor trees carefully to observe the first nymphal instars. This will occur early September in the northern areas of Australia to early October in the southern areas. For maximum impact, apply just before the oldest nymphs develop wings (approximately 10 days after hatching). Apply a second spray 7 to 14 days after the first spray to eradicate the next lot of nymphs that will emerge from the leaf tissue. If the nymphs look large, the shorter time is applicable, if small, choose the longest time.</p> <p><u>Summer treatment</u> If no sprays were applied in Spring, or an alternative chemical used in Spring that cannot be used again, or an earlier spraying failed to give adequate control, monitor the trees again in the December to January period for the second hatching and apply two sprays 7 to 14 days apart, as described above. It is important to treat either the Spring or Summer hatching. If spraying to control a third hatching in March to April, ensure the harvest does not occur before the expiry of the withholding period. Apply a maximum of 4 applications per season.</p>	H Bee H	R1

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Esfenvalerate (Sumi-Alpha) Sumitomo PER86677	3A	Contact	H:14 NG	A	ALL (excl. VIC)	Permitted in olives for control of Olive Lace Bug . Monitor tree foliage closely and apply at first sign of infestation and whilst still in the nymphal stage. Spring is the most effective time to control olive lace bug. Hatching, however, can continue up to March and April. As eggs cannot be seen, monitor trees carefully to observe the first nymphal instars. These should be evident early September in the northern areas of Australia to early October in the southern areas. For maximum impact, apply just before the oldest nymphs develop wings - approximately 10 days after hatching. Subsequent sprays may be necessary to eradicate further generations of nymphs that emerge from the leaf tissue. Up to 4 applications can be made at 14 day intervals, provided harvest does not occur before the expiry of the withholding period.	VH Bee H	-
Potassium Salts of Fatty Acid (Natrasoap) PER14414		Contact	NR	A	ALL (excl. VIC)	Permitted in olives for control of Olive Lace Bug . Spring is the most effective time to control lace bug. Monitor trees carefully to observe the first nymph instars. This will occur early-September in the northern areas of Australia to early-October in the southern areas. For maximum impact, apply foliage spray just prior to the oldest nymphs developing wings. Apply a second spray 7 to 10 days after the initial spray to eradicate the next batch of nymphs to emerge from leaf tissue. If nymphs are large in size, the shorter repeat time is recommended. Select the longer repeat time when nymphs are small in size.	L Bee L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Pyrethrins (Pyganic) PER81870	3A	Contact	1	A	ALL	Permitted in olives for control of Olive Lace Bug . Apply a maximum of six foliar applications per crop at a minimum 14 day re-treatment interval. DO NOT apply more than 2 consecutive sprays before changing to a different insecticide (MoA) group. NOTE: Spring is the most effective time to control this pest. As eggs cannot be seen, monitor trees carefully to observe first nymphal instars. This will occur early September in the northern areas of Australia to early October in the southern areas. For maximum impact, apply just before the oldest nymphs develop wings (approximately 10 days after hatching).	VH Bee H	-
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Ingestion / IGR		P		Hort Innovation project ST16006 (AgVet grant) generating data for a label extension to control Olive Lace Bug and Scale in olives. Pyriproxyfen: AU MRLs 1 mg/kg (olives); 1mg/kg (olive oil – crude).	M Bee H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Ingestion / Systemic		P		Hort Innovation project ST17000 generating data for a label extension for control of Olive Lace Bug and Black Scale in olives.	L Bee L	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-
Black Scale (<i>Saissetia oleae</i>)								
Priority: Moderate								
Rated as a moderate priority in VIC and WA, a high priority in SA and a low priority in NSW. Several species of scale can infest olives but Black Scale is the most significant. It is present in all growing regions. They excrete honeydew which promotes development of sooty mould on leaves, branches and fruit. This can lead to reduced fruit yields and quality.								
Botanical Oil (Eco-Oil)		Contact	NR	A	ALL	Registered in olives for control of Black Scale . Apply at early signs of Scale. Apply 2 sprays at 7 day intervals. Repeat applications at signs of reinfestation. Treatments per season not limited.	L Bee L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Fenoxycarb (Insegar) Syngenta	7B	Contact & Ingestion	56	A	ALL	Registered in olives for control of Black Scale . Make the first application when scale hatchings are at 75% and the second application when hatchings are at 100%. Minimum retreatment interval 10 days. Do not use more than 2 applications per season.	L Bee VL	-
Paraffinic Oil		Contact	1	A	ALL	Registered in olives for control of Black Scale and Soft Brown Scale. Best results are achieved when applied to crawlers in spring. Do not use more than 4 applications per season, with 2 weeks minimum application interval.	L Bee L	-
Pyriproxyfen (Admiral) Sumitomo	7C	IGR / Ingestion	H:7 NG	A	ALL	Registered in olives for control of Black Scale . Apply at the time of crawler release which is usually December to January but also may occur in autumn. Do not apply more than twice per season.	VL Bee L	-
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Ingestion / IGR		P		Hort Innovation project ST16006 (AgVet grant) generating data for a label extension to control Olive Lace Bug and Scale in olives. Pyriproxyfen: AU MRLs 1 mg/kg (olives); 1mg/kg (olive oil – crude).	M Bee H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Ingestion / Systemic		P		Hort Innovation project ST17000 generating data for a label extension for control of Olive Lace Bug and Black Scale in olives.	L Bee L	-
Buprofezin (Applaud) Corteva	16	Contact & Ingestion		P		Registered for control of Scale in citrus, custard apple, mango, passionfruit and persimmon. AU MRLs: T0.5 mg/kg (olives); T2 mg/kg (olive oil – crude).	M Bee L	-
NUL3145 Nufarm	TBC			P		New product in development from Nufarm with activity on Scale , Nematodes, Mealybug and Whitefly.		-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of Scale in citrus, grapes, mango, passionfruit, pome fruit and stone fruit.	M Bee L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Curculio Beetle / Apple Weevil (<i>Otiorhynchus cribricollis</i>)								
Priority: Low								
Rated as a low priority in VIC, WA and NSW and a moderate priority in SA. Severe infestations of adults can damage growing tips, especially in young trees. The larvae are soil-dwelling and may damage the plant roots. An alternative to insecticide butt treatment is the use of a sticky or fibrous barrier applied to the tree trunk.								
Alpha-Cypermethrin PER14791	3A	Contact	NR NG	A	ALL (excl. VIC)	Permitted in olives for control of Curculio Beetle and Cutworms. DO NOT apply more than two applications per season to trees that are of fruit bearing age. Drench spray to the butts of trees and the ground around the butt. It is recommended that this treatment NOT be applied to trees older than 2 years to maximise beneficial predators and parasites that may be adversely affected from use of this product.	VH Bee H	-
DC-163 Bayer	TBC			P		Hort Innovation project ST17000 in progress to generate data for control of Apple Weevil (Curculio Beetle) in olives. Project completion expected in March 2022.	L-M Bee VH	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
Armoured Scales (<i>Hemiptera: Diaspididae</i>)								
Priority: Low								
Rated as a low priority in VIC, WA and NSW and a moderate priority in SA. No honeydew or sooty mould occurs. Can cause fruit marking and scale-encrusted fruit. No specific control measures available but options to control Black Scale will provide control of Armoured Scale if present.								
Botanical Oil (Eco-Oil)	-	Contact	NR	P-A	ALL	Registered in olives for control of Black Scale.	L Bee L	-
Fenoxycarb (Insegar) Syngenta	7B	Contact & Ingestion	56	P-A	ALL	Registered in olives for control of Black Scale.	L Bee VL	-
Paraffinic Oil	-	Contact	1	P-A	ALL	Registered in olives for control of Black Scale and Soft Brown Scale.	L Bee L	-
Pyriproxyfen (Admiral) Sumitomo	7C	IGR / Ingestion	H:7 NG	P-A	ALL	Registered in olives for control of Black Scale.	VL Bee L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Ingestion / IGR		P		Registered for control of Mealybugs and Fruit Spotting Bugs in avocado, citrus, grapes, macadamia and mango. Hort Innovation project ST16006 (AgVet grant) generating data for a label extension to control Olive Lace Bug and Scale in olives. Pyriproxyfen: AU MRLs 1 mg/kg (olives); 1mg/kg (olive oil – crude).	M Bee H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Ingestion / Systemic		P		Hort Innovation project ST17000 generating data for a label extension for control of Olive Lace Bug and Scale in olives.	L Bee L	-
Buprofezin (Applaud) Corteva	16	Contact & Ingestion		P		Registered for control of Scale in citrus, custard apple, mango, passionfruit and persimmon. AU MRLs: T0.5 mg/kg (olives); T2 mg/kg (olive oil – crude).	M Bee L	-
NUL3145 Nufarm	TBC			P		New product in development from Nufarm with activity on Scale , Nematodes, Mealybug and Whitefly.		-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of Scale in citrus, grapes, mango, passionfruit, pome fruit and stone fruit.	M Bee L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of Scale in citrus.	M Bee VH	-
Olive Bud Mite (<i>Oxycenus maxwelli</i>)								
Priority: Low								
Rated as a low priority in VIC, WA and NSW and a moderate priority in SA. Olive Bud Mite feed on developing buds, shoots and leaves, causing malformations and shortening of internodes between young leaves.								
Dimethoate PER13999	1B	Contact	H:42 NG	P-A	ALL	Permitted in olives for control of Olive Lace Bug, Green Vegetable Bug and Rutherglen Bug. Registered for control of mites in various crops.	H Bee H	R1
Spiromesifen (Oberon) Bayer	23	Ingestion		P		Hort Innovation project ST19020 (AgVet grant) pending approval to generate data for a new registration to control Olive Bud Mite in olives.	M Bee VL	-
<i>Beauveria bassiana</i> (Velifer) BASF	UN	Biological/ Ingestion		P		Registered for suppression of Onion Thrips and Western Flower Thrips in protected vegetables and ornamentals and has activity on Thrips, Aphids, Whitefly and Mites. No MRLs required for a biological product.	L Bee L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Diafenthiuron + Cyantraniliprole (Minecto Forte) Syngenta	12A+28	Ingestion & Contact		P		Registration progressing for control of various Lepidoptera, Aphids and Mites in fruiting vegetables and cucurbits.	M Bee VH	-
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-
<p>Plague Thrips (<i>Thrips imaginis</i>) Western Flower Thrips (<i>Frankliniella occidentalis</i>) Priority: Low</p> <p>Rated as a low priority in VIC, WA and NSW and a moderate priority in SA. Western Flower Thrips are rated as a low priority in all regions. Nymphs and adults feed on flowers which can lead to deformities in the fruit.</p>								
Potassium Salts of Fatty Acid (Natrasoap)		Contact	NR	A	ALL	Registered in fruit trees for control of Aphids, Thrips , Mealybug, Two-Spotted Mite, Spider Mite and Whitefly. Apply as a cover spray. Treatments per season not limited.	L Bee L	-
Spinetoram (Success Neo) PER89327	5	Ingestion	H:21 NG	P-A	ALL (excl. VIC)	Permitted in olives for control of Fall Armyworm. Registered for control of Western Flower Thrips in various crops. Codex MRL: 0.07 mg/kg (table olives).	M Bee VH	-
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	IGR / Ingestion		P		Registered for control of Kelly's Citrus Thrips in citrus. Hort Innovation project ST16006 (AgVet grant) generating data for a label extension to control Olive Lace Bug and Scale in olives. Pyriproxyfen: AU MRLs 1 mg/kg (olives); 1mg/kg (olive oil – crude).	M Bee H	R2
<i>Beauveria bassiana</i> (Velifer) BASF	UN	Biological/ Ingestion		P		Registered for suppression of Onion Thrips and Western Flower Thrips in protected vegetables and ornamentals. No MRL required for biological product.		-
Flupyradifurone (Sivanto Prime) Bayer	4D	Ingestion/ Systemic		P		Registered for control of Fruit Spotting Bug and Flower Thrips in macadamia. Hort Innovation project ST17000 generating data for a label extension for control of Olive Lace Bug in olives. Due for completion November 2020.	L Bee L	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of Plague Thrips and Western Flower Thrips in various crops.	M Bee L	-
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-
Rutherglen Bug (<i>Nysius vinitor</i>) Priority: Low								
Rated as a low priority in VIC, WA and NSW and a moderate priority in SA. Rutherglen Bug are a sporadic pest that can cause direct feeding damage to leaves and twigs, particularly in younger trees. The canopy on larger trees is generally higher than the bugs will travel.								
Dimethoate PER13999	1B	Contact	H:42 NG	A	ALL	Permitted in olive trees (for olive oil production only) for control of Olive Lace Bug, Green Vegetable Bug and Rutherglen Bug . Apply as a cover spray if the numbers warrant action. Do not use more than 4 applications per season.	H Bee H	R1
Flupyradifurone (Sivanto Prime) Bayer	4D	Ingestion/ Systemic		P		Hort Innovation project ST17000 generating data for a label extension for control of Olive Lace Bug and Scales in olives.	L Bee L	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of Rutherglen Bug in brassicas, fruiting vegetables and tuber vegetables.	M Bee VH	-
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-
Olive Fruit Caterpillar (<i>Cryptoblabes</i> spp.) Priority: Low								
Rated as a low priority in all regions. Olive Fruit Caterpillar are thought to be a problem in olive groves adjacent to cereal crops. Larvae cause direct feeding damage to the fruit.								
Spinetoram (Success Neo) Corteva PER89327	5	Ingestion	H:21 NG	P-A	ALL (excl. VIC)	Permitted in olives for control of Fall Armyworm. Registered for control of various Lepidoptera in various crops.	M Bee VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
DC-163 Bayer	TBC			P		Hort Innovation project ST17000 in progress to generate data for control of Apple Weevil (Curculio Beetle) in olives, also with activity on Lepidoptera. Project completion expected in March 2022.	L-M Bee VH	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
Spinosad (Entrust Organic) Corteva	5	Ingestion		P		Registered for control of various Lepidoptera in various crops.	L Bee H	-
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-
Garden Weevil (<i>Phlyctinus callosus</i>)								
Priority: Low								
Rated as a low priority in VIC, WA and NSW and a moderate priority in SA. Severe infestations of adults can damage growing tips, especially in young trees. The larvae are soil-dwelling and may damage the plant roots. An alternative to insecticide butt treatment is the use of a sticky or fibrous barrier applied to the tree trunk.								
Alpha-Cypermethrin PER14791	3A	Contact	NR NG	P-A	ALL (excl. VIC)	Permitted in olives for control of Curculio Beetle and Cutworms.	VH Bee H	-
DC-163 Bayer	TBC			P		Hort Innovation project ST17000 in progress to generate data for control of Apple Weevil (Curculio Beetle) in olives. Project completion expected in March 2022.	L-M Bee VH	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
Root Knot Nematode (<i>Meloidogyne</i> spp.)								
Citrus Nematode (<i>Tylenchulus semipenetrans</i>)								
Root Lesion Nematode (<i>Pratylenchus</i> spp.)								
Priority: Low								
Rated as a low priority in all regions. Nematodes do not usually impact on olive production, although they can damage young trees if present in large numbers.								
Fluazaindolizine (Reklemel, Salibro) Corteva	New			P		New MOA nematicide under development in AU by Corteva, to be launched globally in 2021.		-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Fluopyram (Velum Prime) Bayer	7			P		Registration pending for control of nematodes in various crops. AU MRL 0.1 mg/kg. Codex MRL 0.8 mg/kg.		-
NUL3145 Nufarm	TBC			P		New product in development from Nufarm with activity on Scale, Nematodes, Mealybug and Whitefly.		-
SYNSTN1 Syngenta	TBC			P		New nematicide in development from Syngenta.		-
African Black Beetle (<i>Heteronychus arator</i>)								
Priority: Low								
Rated as a low priority in all regions. African Black Beetle is a soil-dwelling beetle that can cause significant damage to young trees. Larger trees can withstand feeding damage to roots and shoots.								
Chlorpyrifos (Lorsban) PER14575	1B	Contact	NR NG	A	ALL (excl. VIC)	Permitted in olives for control of Ants and African Black Beetle . Apply as a soil drench around the base of the tree. Do not use more than 2 applications per season to trees that are of fruit bearing age.	H Bee H	R1
Alpha-Cypermethrin PER14791	3A	Contact	NR NG	P-A	ALL (excl. VIC)	Permitted in olives for control of Curculio Beetle and Cutworms.	VH Bee H	-
DC-163 Bayer	TBC			P		Hort Innovation project ST17000 in progress to generate data for control of Apple Weevil (Curculio Beetle) in olives. Project completion expected in March 2022.	L-M Bee VH	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
Australian Plague Locust (<i>Chortoicetes terminifera</i>)								
Spur-Throated Locust (<i>Austracris guttulosa</i>)								
Migratory Locust (<i>Locusta migratoria</i>)								
Wingless Grasshopper (<i>Phaulacridium vittatum</i>)								
Priority: Low								
Rated as a low priority in all regions. Locusts and grasshoppers can cause direct feeding damage to foliage, which requires urgent treatment in cases of locust swarms. Permits for pesticide use are normally issued in years of locust outbreaks.								
No control options available.								

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Queensland Fruit Fly (<i>Bactrocera tryoni</i>) Mediterranean Fruit Fly (<i>Ceratitis capitata</i>) Priority: Low Rated as a low priority in all regions. Fruit Fly can cause direct damage to fruit. Eggs are laid and larvae develop in the fruit. Damaged fruit may prematurely ripen or fall.								
4-(P-Acetoxyphenyl) - 2-Butanone + Maldison	1B	Contact	NR	A	ALL	Registered in fruit trees for use as a trap for Queensland Fruit Fly . Used to detect the presence of Fruit Fly in the orchard to assist with making decisions about control.	H Bee H	R3
4-(P-Acetoxyphenyl) - 2-Butanone + Fipronil	2B	Contact	NR	A	ALL	Registered in fruit crops for population reduction and population monitoring of Queensland Fruit Fly and Lesser Queensland Fruit Fly. Single stations can be used for population monitoring. Control of fruit fly required placement of 16 stations per hectare and should be used in conjunction with regular insecticide cover sprays.	M Bee VH	R3
Dimethoate PER13859	1B	Contact	NR	A	ALL	Permitted in fruit fly host crops for orchard cleanup of Fruit Fly following harvest. Apply as a foliar and/or ground cover spray to both fallen and retained fruit. Do not use more than 2 applications per host crop following harvest. Produce treated under this permit must not be harvested, collected or supplied for human or animal consumption.	H Bee H	R1
Maldison (Fyfanon)	1B	Fruit Fly Bait	3	A	ALL	Registered in fruit trees for control of all Fruit Fly species excluding Mediterranean Fruit Fly. Mix with a protein lure and apply to the foliage, starting 6 weeks before normal ripening of the tree and repeat at 4-10 day intervals while fruit remains on the tree. Avoid contact of the bait with the fruit. Treatments per season not limited.	H Bee H	R3
Methyl Bromide PER80718	8A	Fruit Disinfestation		A	ALL	Permitted in fruit crops for post-harvest disinfestation of Fruit Fly , Silverleaf Whitefly and Thrips, to meet interstate and intrastate quarantine requirements. For use only by persons with an appropriate licence for fumigation with methyl bromide. Apply to the produce for a period of 2 hours. Do not use fumigated produce for stock or human consumption within 3 days on completion of fumigation or until produce has been adequately ventilated.		-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinosad (Naturalure) Corteva	5	Fruit Fly Bait Concentrate	NR	A	ALL	Registered in fruit for control of Fruit Flies including Queensland Fruit Fly and Mediterranean Fruit Fly . Apply as either a band or a spot spray to the lower canopy of fruiting plants. Begin applications as soon as monitoring traps indicate flies are present and fruit is at a susceptible stage. Repeat applications every 7 days, re-applying sooner if rain washes off the deposit. Avoid spraying the fruit as phytotoxicity may occur.	L Bee H	-
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact / Systemic and IGR		P		Registered for suppression of Queensland Fruit Fly and Mediterranean Fruit Fly in avocado, mango and citrus. Hort Innovation project ST16006 (AgVet grant) generating data for a label extension to control Olive Lace Bug and Scale in olives. Pyriproxyfen: AU MRLs 1 mg/kg (olives); 1mg/kg (olive oil – crude).	M Bee H	R2
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
Green Vegetable Bug (<i>Nezara viridula</i>)								
Priority: Low								
Rated as a low priority in all regions. Green Vegetable Bug is a sporadic pest. Outbreaks can lead to significant feeding damage in fruit.								
Dimethoate PER13999	1B	Contact	H:42 NG	A	ALL	Permitted in olive trees (for olive oil production only) for control of Olive Lace Bug, Green Vegetable Bug and Rutherglen Bug. Apply as a cover spray if the numbers warrant action. Do not use more than 4 applications per season.	H Bee H	R1
Flupyradifurone (Sivanto Prime) Bayer	4D	Ingestion/ Systemic		P		Registered for control of Fruit Spotting Bug and Flower Thrips in macadamia. Hort Innovation project ST17000 generating data for a label extension for control of Olive Lace Bug in olives. Due for completion November 2020.	L Bee L	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of Rutherglen Bug in brassicas, fruiting vegetables and tuber vegetables.	M Bee VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-
Light Brown Apple Moth (<i>Epiphyas postvittana</i>)								
Priority: Low								
Rated as a low priority in all regions. Larvae cause feeding damage to the growing tips and flowers.								
<i>Bacillus thuringiensis subsp Kurstaki</i> Strain Hd-1	11	Ingestion	NR	A	ALL	Registered in fruit crops for control of Armyworm, Cotton Bollworm, Native Budworm, Cabbage Moth, Cabbage White Butterfly, Loopers, Light Brown Apple Moth and Vine Moth. Time spraying to coincide with egg hatch. Treatments per season not limited.	VL Bee VL	-
Chlorpyrifos (Lorsban) PER14575	1B	Contact	NR NG	A	ALL (excl. VIC)	Permitted in olives for control of Light Brown Apple Moth .	H Bee H	R1
Spinetoram (Success Neo) Corteva PER89327	5	Ingestion	H:21 NG	P-A	ALL (excl. VIC)	Permitted for control of Fall Armyworm in olives. Registered for control of Light Brown Apple Moth in various crops. No MRL for AU. Codex MRL – Table olives: 0.07 mg/kg.	M Bee VH	-
DC-163 Bayer	TBC			P		Hort Innovation project ST17000 in progress to generate data for control of Apple Weevil (Curculio Beetle) in olives, also with activity on lepidoptera. Project completion expected in March 2022.	L-M Bee VH	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Cicadas (<i>Cicadidae</i>)								
Priority: Low								
Rated as a low priority in all regions. Cicadas can cause significant damage to olives in Queensland. The females slit twigs and insert rows of eggs.								
No control options available.								
Cutworms (<i>Agrostis</i> spp.)								
Priority: Low								
Rated as a low priority in all regions. Cutworms are soil borne insects that can damage the roots and stems of young trees.								
Alpha-Cypermethrin PER14791	3A	Contact	NR NG	A	ALL (excl. VIC)	Permitted in olives for control of Curculio Beetle and Cutworms . DO NOT apply more than two applications per season to trees that are of fruit bearing age. Drench spray to the butts of trees and the ground around the butt. It is recommended that this treatment NOT be applied to trees older than 2 years to maximise beneficial predators and parasites that may be adversely affected from use of this product.	VH Bee H	-
Slugs and Snails (<i>Gastropoda</i>)								
Priority: Low								
Rated as a low priority in all regions. Slugs and snails can be a problem in some areas of SA and WA. In large numbers they can smother branches and cause broken limbs due to excess weight for the branches to bear.								
Metaldehyde		Contact	7	A	ALL	Registered in fruit crops for control of Slugs and Snails . Broadcast evenly over the surface of the ground around trees to be protected and in areas where slugs and snails congregate.		-
Green Tree Ant (<i>Oecophylla smaragdina</i>)								
Priority: Low								
Rated as a low priority in all regions. Green Tree Ant are a nuisance pest in orchards. The ants do not cause damage to trees.								
Pyriproxyfen (Distance Ant Bait) Sumitomo	7C	IGR / Bait	NR	A	ALL	Registered in Tropical Fruit Plantations for control of invasive and nuisance ants . Apply baits in early spring or summer at first sign of ant activity. DO NOT exceed 3 applications per year and a minimum of 3 months between each treatment.	VL Bee L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Metaflumizone (Siesta Ant Bait) BASF	22B	Ingestion		P		Registration pending in Australia for control of ants in various crops.	-	-
Fall Armyworm (<i>Spodoptera frugiperda</i>)								
Priority: Unknown								
Fall Armyworm has recently been detected in Australia for the first time. It has not been seen in olives and the potential impact is currently unknown.								
Spinetoram (Success Neo) Corteva PER89327	5	Ingestion	H:21 NG	A	ALL (excl. VIC)	Permitted in olives for control of Fall Armyworm . Target eggs and newly hatched larvae before they become entrenched. Do not apply more than 2 applications per season with a minimum retreatment interval of 21 days.	M Bee VH	-
DC-163 Bayer	TBC			P		Hort Innovation project ST17000 in progress to generate data for control of Apple Weevil (Curculio Beetle) in olives, also with activity on Lepidoptera. Project completion expected in March 2022.	L-M Bee VH	-
NUL3445 Nufarm	TBC			P		New product in development from Nufarm with activity on Lepidoptera, Bugs, Beetles/Weevils, Fruit Fly and Thrips.		-
SYNFOI21 Syngenta	New			P		SYNFOI21 is not registered but the first global application is proposed for 2020/21 for Thrips, Bugs, Mites and Caterpillars.		-

4.3 Weeds in Olives

4.3.1 Weed priorities

Common Name	Scientific Name
High	
Flaxleaf Fleabane	<i>Conyza bonariensis</i>
Moderate	
Barnyard Grass	<i>Echinochloa colona</i>
Crowsfoot Grass	<i>Dactyloctenium aegyptium</i>
Low	
Blackberry Nightshade	<i>Solanum nigrum</i>
Pigweed	<i>Portulaca</i> spp.

Flaxleaf Fleabane has been rated as a high priority. Barnyard Grass and Crowsfoot Grass have been rated as a moderate priority and Blackberry Nightshade and Pigweed have been rated as a low priority. An integrated weed management program incorporating mulch and inter-row grass cover should reduce the need for reliance on herbicides in most orchards.

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

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

4.3.2 Available and potential products for weed control

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

Availability			
A	Available via either registration or permit approval		
P	Potential – a possible candidate to pursue for registration or permit		
P-A	Potential, already approved in the crop for another use		
Resistance risk		Regulatory risk (refer to Appendix 6)	
		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 (<i>Conyza bonariensis</i>) Priority: High							
Rated as a high priority in VIC, a moderate priority in NSW and a low priority in SA 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.							
Flumioxazin (Chateau)	G**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds, including Flaxleaf Fleabane .	H:98 G:28	A	ALL	-
Glufosinate (Basta)	N**	Olives / Directed or Shielded Spray	Registered in Olives for control of various grass and broadleaf weeds, including Flaxleaf Fleabane . Do not allow spray to contact any part of the tree, including the trunk.	H:NR G:56	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Barnyard Grass (<i>Echinochloa colona</i>)							
Priority: Moderate							
Rated as a moderate priority in VIC and SA, and a low priority in NSW and WA. Barnyard Grass germinates in the warmer months and grows rapidly under favourable conditions. It has developed widespread resistance to Group M herbicides in Australia.							
Flumioxazin (Chateau)	G**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds, including Barnyard Grass . Apply as a directed spray.	H:96 G:28	A	ALL	-
Glufosinate (Basta)	N**	Olives / Directed or Shielded Spray	Registered in Olives for control of various grass and broadleaf weeds, including Barnyard Grass . Do not allow spray to contact any part of the tree, including the trunk.	H:NR G:56	A	ALL	R3
Glyphosate (Roundup)	M**	Olives / Directed Spray, Shielded Spray or Wick Wiper	Registered in Olives for control of various grass and broadleaf weeds, including Barnyard Grass . Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdiict)	A***	Olives / Directed Spray or Spot Spray	Registered in Olives for control of grass weeds, including Barnyard Grass . Apply as a directed spray.	NR	A	ALL	-
Oryzalin	D**	Olives / Non-Bearing Fruit / Directed Spray	Registered in non-fruit bearing Olives for control of various grass and broadleaf weeds, including Barnyard Grass . Apply as a directed spray.	NR	A	ALL	-
Oxyflourfen (Goal)	G**	Olives / Directed Spray	Registered in Olives for control of various grass and broadleaf weeds, including Barnyard Grass . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	H:NR NG	A	ALL	-
Pendimethalin (Stomp)	D**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds, including Barnyard Grass . Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	-
Crowsfoot Grass (<i>Dactyloctenium aegyptium</i>)							
Priority: Moderate							
Rated as a moderate priority in VIC, and a low priority in SA, NSW and WA. Crowsfoot Grass is a prolific and widespread grass weed. It has developed resistance to many herbicides around the world and there is confirmed resistance to Group A and L herbicides in Australia.							
Flumioxazin (Chateau)	G**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds, including Crowsfoot Grass . Apply as a directed spray.	H:96 G:28	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Glufosinate (Basta)	N**	Olives / Directed or Shielded Spray	Registered in Olives for control of various grass and broadleaf weeds, including Crowsfoot Grass . Do not allow spray to contact any part of the tree, including the trunk.	H:NR G:56	A	ALL	R3
Haloxyfop (Verdiict)	A***	Olives / Directed Spray or Spot Spray	Registered in Olives for control of grass weeds, including Crowsfoot Grass . Apply as a directed spray.	NR	A	ALL	-
Oxyflourfen (Goal)	G**	Olives / Directed Spray	Registered in Olives for control of various grass and broadleaf weeds, including Crowsfoot Grass . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	H:NR NG	A	ALL	-
Pendimethalin (Stomp)	D**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds, including Crowsfoot Grass . Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	-
Blackberry Nightshade (<i>Solanum nigrum</i>)							
Priority: Low							
Rated as a low priority in VIC, SA and WA and a high priority in NSW. Blackberry Nightshade is a prolific and widespread weed. Strategic use of herbicides along with cultural control measures are needed to manage this weed.							
Flumioxazin (Chateau)	G**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds, including Blackberry Nightshade .	H:98 G:28	A	ALL	-
Oryzalin	D**	Olives / Non-Bearing Fruit / Directed Spray	Registered in non-fruit bearing Olives for control of various grass and broadleaf weeds, including Blackberry Nightshade . Apply as a directed spray.	NR	A	ALL	-
Oxyfluorfen (Goal)	G**	Olives / Directed Spray	Registered in Olives for control of various grass and broadleaf weeds, including Blackberry Nightshade . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	H:NR NG	A	ALL	-
Pendimethalin (Stomp)	D**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds and registered for suppression of Blackberry Nightshade in various crops.	NR	P-A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Pigweed (<i>Portulaca</i> spp.)							
Priority: Low							
Rated as a low priority in VIC, SA and WA, and as a moderate priority in NSW. Pigweed is a summer growing weed that competes aggressively in-crop and can be difficult to control with herbicides.							
Glufosinate (Basta)	N**	Olives / Directed or Shielded Spray	Registered in Olives for control of various grass and broadleaf weeds, including Pigweed . Do not allow spray to contact any part of the tree, including the trunk.	H:NR G:56	A	ALL	R3
Glyphosate (Roundup)	M**	Olives / Directed Spray, Shielded Spray or Wick Wiper	Registered in Olives for control of various grass and broadleaf weeds, including Pigweed . Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Oryzalin	D**	Olives / Non-Bearing Fruit / Directed Spray	Registered in non-fruit bearing Olives for control of various grass and broadleaf weeds, including Pigweed . Apply as a directed spray.	NR	A	ALL	-
Oxyfluorfen (Goal)	G**	Olives / Directed Spray	Registered in Olives for control of various grass and broadleaf weeds, including Pigweed . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	H:NR NG	A	ALL	-
Pendimethalin (Stomp)	D**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds, including Pigweed . Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	-
Grass and Broadleaf Weeds							
Priority: Low							
No high priority weeds have been identified for Olives. The key to weed management in orchards is maintaining ground cover in the inter-row with grass and mulch.							
Carfentrazone-Ethyl (Spotlight)	G**	Olives / Directed Spray	Registered in Olives for control of various broadleaf weeds . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR	A	ALL	-
Flumioxazin (Chateau)	G**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds . Apply as a directed spray.	H:96 G:28	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Glufosinate (Basta)	N**	Olives / Directed or Shielded Spray	Registered in Olives for control of various grass and broadleaf weeds . Do not allow spray to contact any part of the tree, including the trunk.	H:NR G:56	A	ALL	R3
Glyphosate (Roundup)	M**	Olives / Directed Spray, Shielded Spray or Wick Wiper	Registered in Olives for control of various grass and broadleaf weeds . Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxypop (Verdiict)	A***	Olives / Directed Spray or Spot Spray	Registered in Olives for control of grass weeds . Apply as a directed spray.	NR	A	ALL	-
Oryzalin	D**	Olives / Non-Bearing Fruit / Directed Spray	Registered in non-fruit bearing Olives for control of various grass and broadleaf weeds . Apply as a directed spray.	NR	A	ALL	-
Oxyflourfen (Goal)	G**	Olives / Directed Spray	Registered in Olives for control of various grass and broadleaf weeds . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	H:NR NG	A	ALL	-
Paraquat (Gramoxone)	L**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of various annual grass and broadleaf weeds . Do not allow spray to contact any part of the tree, including the trunk.	H:1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed) PER85411	L**	Olives / Directed Spray or Spot Spray	Permitted in Olives for control of various annual grass and broadleaf weeds . Do not allow spray to contact any part of the tree, including the trunk. Avoid spraying when crops are in flower or fruiting.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	D**	Olives / Directed Spray / Residual Weed Control	Registered in Olives for control of various grass and broadleaf weeds . Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	-

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 MRLs	www.legislation.gov.au/Details/F2020C00050
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/pesticides/en/
Cotton Pest Management Guide 2020-21	https://www.cottoninfo.com.au/publications/cotton-pest-management-guide
CropLife Australia	https://www.croplife.org.au/
Field Guide to Olive Pests, Diseases and Disorders in Australia (Rural Industries Research & Development Corporation)	www.agrifutures.com.au/wp-content/uploads/publications/07-153.pdf
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 olives

Appendix 2. Products available for control of insects, mites and other pests in olives

Appendix 3. Products available for weed control in olives

Appendix 4. Current permits for use in olives

Appendix 5. Olive Maximum Residue Limits (MRLs)

Appendix 6. Olive Agrichemical Regulatory Risk Assessment

Appendix 1. Products available for disease control in olives

Active Ingredient (Trade Name)	Chemical group	Situation	Diseases / Comments	States	WHP Days	Regulatory risk
Azoxystrobin (Amistar)	11	Olives	Anthracoze (<i>Colletotrichum</i> spp.)	ALL	21	-
Bromo Chloro Dimethyl Hydatoin (BCDMH)	-	Sanitiser / Post-Harvest Treatment	External Rot Causing Organisms	ALL	NR	-
Chlorine	-	Sanitiser / Post-Harvest Treatment	Bacteria and Fungi	ALL	NR	-
Copper (Cu) present as copper oxychloride	M1	Olives	Peacock Spot (<i>Spilocea oleaginea</i>) Grey Leaf Spot (<i>Cercospora cladosporioides</i>) Fruit Round Spot (<i>Sphaeropsis dalmatica</i>) Anthracoze (<i>Gloeosporium olivarum</i>) Other General Fruit Rot (<i>Penicillium sp.</i> , <i>Fusarium sp.</i> , <i>Cladosporium sp.</i> , <i>Phomopsis sp.</i> , <i>Alternaria sp.</i> , <i>Geotrichum sp.</i>)	ALL	1	-
Copper (Cu) Present as Cupric Hydroxide Copper (Cu) present as cuprous oxide Copper (Cu) Present as Tribasic Copper Sulphate PER11360	M1	Olives	Peacock Spot (<i>Spilocea oleaginea</i>) Anthracoze (<i>Colletotrichum</i> spp.)	ALL (excl. VIC)	1	-
Mancozeb PER88358	M3	Olives	Anthracoze (<i>Colletotrichum gloeosporioides</i>)	ALL	14	R2
Metiram + Pyraclostrobin (Aero) PER87332	M3+11	Olives	Anthracoze (<i>Colletotrichum gloeosporioides</i>)	ALL (excl. VIC)	H:21 NG	R2
Peroxyacetic Acid	-	Sanitiser / Post-Harvest Treatment	Bacteria	ALL	NR	-

Appendix 2. Products available for control of insects, mites and other pests in olives

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
4-(P-Acetoxyphenyl) -2- Butanone + Maldison	1B	Fruit Trees / Fruit Fly Trap	Queensland Fruit Fly (<i>Bactrocera tryoni</i>)	ALL	NR	R3
4-(P-Acetoxyphenyl) -2- Butanone + Fipronil	2B	Fruit Trees / Fruit Fly Trap	Queensland Fruit Fly (<i>Bactrocera tryoni</i>) Lesser Queensland Fruit Fly (<i>Bactrocera neohumeralis</i>)	ALL	NR	R3
Alpha-Cypermethrin PER14791	3A	Olive	Curculio Beetle / Apple Weevil (<i>Otiorhynchus cribricollis</i>) Cutworms (<i>Agrostis</i> spp.)	ALL (excl. VIC)	NR NG	-
<i>Bacillus thuringiensis subsp Kurstaki</i> Strain Hd-1	11	Fruit	Armyworm (<i>Spodoptera</i> spp.) Cotton Bollworm (<i>Helicoverpa armigera</i>) Native Budworm (<i>Helicoverpa punctigera</i>) Cabbage Moth (<i>Plutella xylostella</i>) Cabbage White Butterfly (<i>Pieris rapae</i>) Loopers (<i>Chrysodeixis</i> spp., <i>Ectropis excursaria</i> , <i>Thysanoplusia orichalcea</i>) Light Brown Apple Moth (<i>Epiphyas postvittana</i>) Vine Moth (<i>Phalaenoides glycinae</i> , <i>Agarista agricola</i>)	ALL	NR	-
Botanical Oil (Eco-Oil)		Olive Plantation	Black Scale	ALL	NR	-
Chlorpyrifos (Lorsban) PER14575	1B	Olive / Ground and Butt Treatment	Ants African Black Beetle	ALL (excl. VIC)	NR NG	R1
Chlorpyrifos (Lorsban) PER14575	1B	Olive / Non-Bearing Trees Only / Foliar Application	Light Brown Apple Moth	ALL (excl. VIC)	H:365 NG	R1
Clothianidin (Samurai) PER14897	4A	Olive	Olive Lace Bug (<i>Froggattia olivinia</i>)	ALL (excl. VIC)	H:56 NG	R2

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Dimethoate PER13999	1B	Olive	Olive Lace Bug (<i>Froggattia olivinia</i>) Green Vegetable Bug (<i>Nezara viridula</i>) Rutherglen Bug (<i>Nysius vinitor</i>)	ALL	H:42 NG	R1
Dimethoate PER13859	1B	Fruit Fly Host Crops / Orchard Cleanup Following Harvest	Fruit Fly	ALL	NR	R1
Esfenvalerate (Sumi-Alpha) PER86677	3A	Olive	Olive Lace Bug (<i>Froggattia olivinia</i>)	ALL (excl. VIC)	H:14 NG	-
Fenoxycarb (Insegar)	7B	Olive	Black Scale (<i>Saissetia oleae</i>)	ALL	56	-
Maldison (Fyfanon)	1B	Fruit Tree / Fruit Fly Bait Spray	Fruit Flies	ALL	3	R3
Metaldehyde		Fruit and Vegetable Crops	Snails and Slugs	ALL	7	-
Methyl Bromide PER80718	8A	Fruit Crops / Post- Harvest Fruit Disinfestation	Fruit Fly Silverleaf Whitefly Thrips	ALL	NR	-
Paraffinic Oil		Olive	Scales (Black Scale, Soft Brown Scale)	ALL	1	-
Potassium Salts of Fatty Acid (Natrasoap)		Fruit Trees	Aphids Thrips Mealybug Two-Spotted Mite Spider Mite Whitefly	ALL	NR	-
Potassium Salts of Fatty Acid (Natrasoap) PER14414		Olives	Lace Bug (<i>Froggattia olivinia</i>)	ALL (excl. VIC)	NR	-
Pyrethrins (Pyganic) PER81870	3A	Olive	Olive Lace Bug (<i>Froggattia olivinia</i>)	ALL	1	-

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory risk
Pyriproxyfen (Admiral)	7C	Olive	Black Scale	ALL	H:7 NG	-
Pyriproxyfen (Distance Ant Bait)	7C	Tropical Fruit Plantation / Ant Bait	Invasive and Nuisance Ants	ALL	NR	-
Spinetoram (Success Neo) PER89327	5	Olive	Fall Armyworm (<i>Spodoptera frugiperda</i>)	ALL (excl. VIC)	H:21 NG	-
Spinosad (Naturalure)	5	Tree, Fruit, Nut, Vine & Vegetable Crops / Fruit Fly Bait	Queensland Fruit Fly (<i>Bactrocera tryoni</i>) Mediterranean Fruit Fly (<i>Ceratitis capitata</i>)	ALL	NR	-

Appendix 3. Products available for weed control in olives

Active ingredient (Trade Name)	Chemical Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory risk
Carfentrazone-Ethyl (Spotlight)	G	Tree Nuts and Assorted Tropical and Sub-Tropical Fruits / Directed Spray or Spot Spray	If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR	ALL	-
Flumioxazin (Chateau)	G	Olives / Directed Spray / Residual Weed Control	Grass and Broadleaf Weeds	H:98 G:28	ALL	-
Glufosinate (Basta)	N	Olives / Directed or Shielded Spray	Do not allow spray to contact any part of the tree, including the trunk. Grass and broadleaf weeds	H:NR G:56	ALL	R3
Glyphosate (Roundup)	M	Olives / Directed Spray, Shielded Spray or Wick Wiper	Do not allow spray to contact any part of the tree, including the trunk. Grass and broadleaf weeds.	NR	ALL	R3
Haloxypop (Verdict)	A	Orchards / Directed Spray or Spot Spray	Grass weeds	NR	ALL	-
Oryzalin	D	Olives / Non-Bearing Fruit / Directed Spray	Grass and broadleaf weeds	NR	ALL	-
Oxyfluorfen (Goal)	G	Olives / Established Trees At Least 3 Years Old – Dormant Application / Directed Spray	Grass and broadleaf weeds. If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	H:NR NG	ALL	-
Paraquat (Gramoxone)	L	Orchards / Directed Spray or Spot Spray	Annual Grass and broadleaf weeds	H:1 G:7	ALL	R3
Paraquat + Diquat (SpraySeed) PER85411	L	Olives / Directed Spray	Grass and Broadleaf Weeds	G:7	ALL	R3
Pendimethalin (Stomp)	D	Deciduous Fruits / Directed Spray / Residual Weed Control	Do not allow spray to contact any part of the tree, including the trunk. Grass and broadleaf weeds.	NR	ALL	-

Appendix 4. Current permits for use in olives

Permit ID	Description	Date Issued	Expiry Date	Permit holder
PER11360 Version 3	Copper / Olives / Fungal Leaf Spot and Fruit Rot.	24-Mar-09	30-Nov-21	AOA c/- Hort Innovation
PER13999 Version 6	Dimethoate / Olives / Various Insect Pests	19-Apr-13	31-Mar-21	Hort Innovation
PER14414	Potassium Salts of Fatty Acids (Natrasoap) / Olives / Lace Bug	04-Oct-13	30-Sep-23	AOA c/- Hort Innovation
PER14575 Version 2	Chlorpyrifos / Olives / Various Insect Pests	23-Dec-13	31-Mar-22	Hort Innovation
PER14791 Version 3	Alpha-Cypermethrin / Olives / Various Insect Pests	06-May-14	30-Nov-21	AOA c/- Hort Innovation
PER14460 Version 2	Ethephon / Olives / Fruit Loosening	01-Jun-14	30-Jun-22	AOA c/- Hort Innovation
PER13859 Version 2	Dimethoate / Orchard Cleanup - Fruit Fly Host Crops Following Harvest / Fruit Fly	9-Feb-15	31-Jul-24	Hort Innovation
PER14897 Version 2	Clothianidin (Samurai) / Olives / Olive Lace Bug	04-Mar-15	31-Mar-23	AOA c/- Hort Innovation
PER80718 Version 3	Methyl Bromide / Post-Harvested Fruit and Fruiting Vegetables, Food Producing Plants and Ornamentals / Fruit Fly, Silverleaf Whitefly, Thrips For use by licensed fumigators only	12-Apr-15	31-Mar-25	Biosecurity SA
PER81870 Version 2	Pyrethrins (Pyganic) / Olives / Olive Lace Bug	17-Dec-16	31-Oct-24	Hort Innovation
PER85411 Version 2	Paraquat + Diquat (Spray.Seed) / Olives / Various Weeds	01-Nov-17	30-Nov-22	AOA c/- Hort Innovation
PER86677	Esfenvalerate, Sumi-Alpha Flex Insecticide / Olives / Olive Lace Bug	21-Dec-18	31-Dec-23	Hort Innovation
PER87332	Metiram + Pyraclostrobin (Aero) / Olives / Anthracnose	01-Jul-19	31-Jul-24	Hort Innovation
PER89327	Spinetoram (Success Neo) / Olives / Fall Armyworm	24-Mar-20	31-Mar-23	Hort Innovation
PER88358	Mancozeb / Olives / Anthracnose	02-Jul-20	31-Jul-23	Hort Innovation

Appendix 5. Olive Maximum Residue Limits (MRLs)

CODEX commodity groupings of Olives and subgroups:

FT 0305	Olives, Table Olives
AO2 0002	Fruits
FI 0026	Tropical - edible peel
OC 0305	Olive oil, crude
OR 0305	Olive oil, refined
OV 0305	Olive oil, virgin
SO 0305	Olives for oil production

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

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Aldrin and Dieldrin		Fruits	E0.05	
Azoxystrobin	FT 0305	Olives	T2	
Bifenthrin	FT 0305	Olives	T0.5	
Bromide Ion		Fruits		20
Buprofezin	OC 0305	Olive oil, crude	T2	
	FT 0305	Olives	T0.5	
	FT 0305	Table olives		5
Carbaryl	FT 0305	Table olives		30
	OC 0305	Olive oil, virgin		25
Carfentrazone-ethyl	FT 0026	Tropical - edible peel	*0.05	
Chlorpyrifos	FT 0305	Olives	*T0.05	
Clothianidin	FT 0305	Table olives	T0.3	
Cyhalothrin (includes lambda-cyhalothrin)	FT 0305	Table olives		1
Cypermethrin	FT 0305	Olives	*T0.05	
Cypermethrins (including alpha- and zeta- cypermethrin)	FT 0305	Table olives		*0.05
	OC 0305	Olive oil, virgin		0.5
	OR 0305	Olive oil, refined		0.5
DDT		Fruits	E1	
Deltamethrin	FT 0305	Table olives		1
Diazinon		Fruits	0.5	
	OC 0305	Olive oil, crude	2	
Dicofol		Fruits	5	
Difenoconazole	FT 0305	Table olives		2
Dimethoate	OR 0305	Olive oil, refined	T0.1	
	FT 0305	Table olives		0.5
Diquat		Fruits	*0.05	
Dithianon		Fruits	2	

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Dithiocarbamates (mancozeb, metham, metiram, thiram, zineb and ziram)	FT 0305	Olives	T2	
	SO 0305	Olives for oil production	T30	
	FT 0305	Table olives	T30	
Ethephon	FT 0305	Olives	T20	
	FT 0305	Table olives		7
Fenoxycarb	OC 0305	Olive oil, virgin	7	
	SO 0305	Olives for oil production	2	
	FT 0305	Table olives	2	
Fenthion	FT 0305	Table olives		1
	OC 0305	Olive oil, virgin		1
Fenvalerate	OC 0305	Olive oil, crude	T5	
	SO 0305	Olives for oil production	T1	
	FT 0305	Table olives	T1	
Fluazifop-p-butyl	FT 0305	Olives	T0.05	
	SO 0305	Olives for oil production		*0.01
	FT 0305	Table olives		*0.01
Flumioxazin	FT 0305	Olives	*0.02	
	FT 0305	Table olives		*0.02
Glufosinate and Glufosinate ammonium	FT 0305	Olives	*0.1	
	FT 0026	Tropical - edible peel		0.1
Glyphosate	FT 0305	Olives	*0.1	
Imidacloprid	SO 0305	Olives for oil production		2
	FT 0305	Table olives		2
Indoxacarb	FT 0305	Olives	T0.2	
Inorganic bromide		Fruits	20	
Isoxaben	FT 0026	Tropical - edible peel	*0.01	
Kresoxim-Methyl	OC 0305	Olive oil, virgin	0.7	
	FT 0305	Olives	0.2	
	SO 0305	Olives for oil production		0.2
	FT 0305	Table olives		0.2
	OC 0305	Olive oil, virgin		1
Lindane		Fruits	E0.5	
Maldison		Fruits	2	
Metaldehyde		Fruits	1	
Methiocarb		Fruits	T0.1	
Methyl bromide		Fruits	*T0.05	
Omethoate		Fruits	2	
Oryzalin		Fruits	0.1	
Oxyfluorfen	FT 0305	Olives	1	

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Paraquat	FT 0305	Olives	1	
	FT 0305	Table olives		0.1
Pendimethalin	FT 0305	Olives	*0.05	
Permethrin	FT 0305	Table olives		1
Piperonyl butoxide		Fruits	8	
Pirimicarb		Fruits	0.5	
Pyraclostrobin	OC 0305	Olive oil, crude	T3	
	SO 0305	Olives for oil production	T0.3	0.01
	FT 0305	Table olives	T0.3	0.01
	OC 0305	Olive oil, virgin		0.07
Pyrethrins		Fruits	1	
	OC 0305	Olive oil, crude	T3	
Pyriproxyfen	OC 0305	Olive oil, crude	1	
	FT 0305	Olives	1	
Simazine		Fruits	*0.1	
Spinetoram	FT 0305	Table olives		0.07
Tebuconazole	FT 0305	Table olives		*0.05
Trichlorfon	FT 0026	Tropical - edible peel	T3	
Trifloxystrobin	FT 0305	Table olives		0.3
	OC 0305	Olive oil, virgin		0.9
	OR 0305	Olive oil, refined		1.2
Trifluralin		Fruits	*0.05	

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

NOTE: For the groups "Assorted tropical and sub-tropical fruits - edible peel" and "Fruits" listed above, (Olives) crop group exclusions (if any) have not been specified.

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

T = Temporary MRL

E = The MRL is based on extraneous residues

Po = The MRL accommodates post-harvest treatment of the commodity

Sources: APVMA MRLs: Agricultural and Veterinary Chemicals Code (MRL Standard) Instrument 2019. Compilation 4. Prepared 15 January 2020. CODEX MRLs: CODEX Alimentarius International Food Standards database (February 2020), <http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/>

Appendix 6. Olive Agrichemical Regulatory Risk Assessment

Olive Agrichemical Regulatory Risk assessment

October 2020

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 olives as well as current initiatives aimed at addressing identified pest management deficiencies.

Olives Agrichemical Regulatory Risk Assessment

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

Problem	Active Constituents	Chemical group	Comment	Activities
INSECT AND MITE PESTS				
Ants				
Ants	Pyrethrins	3A		
Ants	Pyriproxyfen	7C	EU – Authorisation renewal process underway	
Ants	Chlorpyrifos (PER14575)	1B	APVMA: Currently under review. Potential issues w.r.t. environmental loading and worker exposure. Codex: Scheduled for review by JMPR in 2021 Canada –Cancellation of most uses. EU: Cancellation of use USA – EPA decision to allow continued use	
Ants ⁴	Pyriproxyfen	7C	EU – Authorisation renewal process underway	
Red imported fire ant	Indoxacarb	22A	EU: Proposed non-renewal	
Red imported fire ant	S-methoprene	7A		
Beetles				
African black beetle	Chlorpyrifos (PER14575)	1B	APVMA: Currently under review. Potential issues w.r.t. environmental loading and worker exposure. Codex: Scheduled for review by JMPR in 2021 Canada –Cancellation of most uses. EU: Cancellation of use USA – EPA decision to allow continued use	
Apple weevil (Curculio beetle)	Alpha-cypermethrin (PER14791)	3A	EU: Proposed restricted authorisation & Candidate for substitution	

⁴ – Nuisance, Black ants, Coastal brown ant, Exotic yellow crazy ant, Green tree ant, Greenhead (Pony) ants, Long-legged ants, Meat ants, Pennant (Pavement) ants, Red imported fire ant, Singapore ant, Sugar ants, Tramp ants, Tropical fire ant, Tyrant ants

Olives Agrichemical Regulatory Risk Assessment

Problem	Active Constituents	Chemical group	Comment	Activities
Caterpillars/Lepidoptera				
Armyworms	<i>B thuringiensis</i>	11A		
Cabbage white butterfly	<i>B thuringiensis</i>	11A		
Caterpillars	Pyrethrins	3A		
Cotton bollworm	<i>B thuringiensis</i>	11A		
Cutworms	Alpha-cypermethrin (PER14791)	3A	EU: Proposed restricted authorisation & Candidate for substitution	
Fall armyworm	Spinetoram (PER89327)	5		
Grapevine moth	<i>B thuringiensis</i>	11A		
Green looper	<i>B thuringiensis</i>	11A		
Lightbrown apple moth	<i>B thuringiensis</i>	11A		
Lightbrown apple moth	Chlorpyrifos (PER14575)	1B	APVMA: Currently under review. Potential issues w.r.t. environmental loading and worker exposure. Codex: Scheduled for review by JMPR in 2021 Canada –Cancellation of most uses. EU: Cancellation of use USA – EPA decision to allow continued use	
Looper caterpillars	<i>B thuringiensis</i>	11A		
Native budworm	<i>B thuringiensis</i>	11A		
Painted vine moth	<i>B thuringiensis</i>	11A		
Soybean looper	<i>B thuringiensis</i>	11A		
Tobacco looper	<i>B thuringiensis</i>	11A		
Twig (pear) looper	<i>B thuringiensis</i>	11A		
Fruit flies				
Fruit fly baits	Spinosad bait	5		
Mediterranean fruit fly	Spinosad	5		
Queensland fruit fly	Spinosad	5		
Lesser Queensland fruit fly	Fipronil lure traps	2B	APVMA – Under review	
Queensland fruit fly	Fipronil lure traps	2B	Codex: Re-evaluation scheduled for 2021/22 EU: No authorisation in place	

Olives Agrichemical Regulatory Risk Assessment

Problem	Active Constituents	Chemical group	Comment	Activities
Plant bugs				
Brown marmorated stink bug	Pyrethrins	3A		
Green vegetable bug	Dimethoate (PER13999)	1B	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
Leafhoppers	Pyrethrins	3A		
Olive lace bug	Clothianidin (PER14897)	4A	APVMA – Under review Canada – Proposal to cancel foliar use in orchards, strawberries and turf EU: Removal of all field uses USA: Re-registration with new risk mitigation measures ⁱ	Project ST16006 with Trivor® (acetamiprid + pyriproxyfen) data generation - registration Data generation project
	Dimethoate (PER13999)	1B	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	Data generation project ST17000 for Sivanto®
	Esfenvalerate (PER86677)	3A	EU: Candidate for substitution	(flupyradifurone).
	Fatty acids - K salt (PER14414)	U1		Data generation project
	Pyrethrins (PER81870)	3A		MT17012 for Pyrethrins.
Rutherglen bug	Dimethoate (PER13999)	1B	Codex: MRL deletion recommended. EU proposing to set all MRLs to < 0.01 mg/kg	
Yellow spotted stink bug	Pyrethrins	3A		
Scale Insects				
Black (Brown olive) scale	Botanical oil - emulsifiable			Project ST16006 with Trivor® (acetamiprid + pyriproxyfen) data generation - registration
	Fenoxycarb	7B		
	Paraffinic oil			
	Pyriproxyfen	7C	EU: Authorisation renewal process underway	
Olive parlatoria scale	Paraffinic oil			ST17000 for Sivanto® (flupyradifurone).
Red scale	Paraffinic oil			
Scale insects	Paraffinic oil			
Soft brown scale	Paraffinic oil			
Other				
Earwigs	Pyrethrins	3A		

Olives Agrichemical Regulatory Risk Assessment

Problem	Active Constituents	Chemical group	Comment	Activities
DISEASES				
Alternaria fruit rot	Copper)	M1	EU: Candidates for substitution and their uses to be phased out	
Anthracnose	Azoxystrobin	11		Data generation projects ST16006 Luna Experience (Fluopyram + Tebuconazole) Luna Sensation (Fluopyram + Trifloxystrobin) and MT17012 for mancozeb for anthracnose.
	Copper	M1	EU: Candidates for substitution and their uses to be phased out	
	Mancozeb (PER88358)	M3	APVMA - Nominated for review Canada – Under review Codex - To be reviewed 2022/23 EU: Authorisation not renewed	
	Metiram + pyraclostrobin (PER87332)	M3 + 11	Metiram APVMA - Nominated for review Canada – Proposed cancelling of all foliar uses except in potato Codex – To be reviewed 2022/23 Pyraclostrobin USA: Interim review decision 2020 Label amendments proposed	
Blue & green moulds	Copper	M1	EU: Candidates for substitution and their uses to be phased out	
Fruit rot - Cladosporium	Copper	M1		
Fruit rot/spots	Copper	M1		
Fruit round rot	Copper	M1		
Fusarium fruit rot	Copper	M1		
Geotrichum fruit rot/s	Copper	M1		
Leaf diseases/spots	Copper (PER11360)	M1		
Leaf mould (Olive leaf spot)	Copper	M1		
Peacock spot	Copper	M1		
Phomopsis fruit rot	Copper	M1		

Olives Agrichemical Regulatory Risk Assessment

Problem	Active Constituents	Chemical group	Comment	Activities
WEEDS				
Broadleaf & Grass weeds	Carfentrazone-ethyl			
	Diquat (PER85411)	L	APVMA - Currently under review Europe – deregistered	
	Flumioxazin	G	EU: Candidate for substitution	
	Glufosinate-ammonium	N	Europe – deregistered	
	Glyphosate	M	Ongoing issues internationally	
	Oryzalin	D		
	Oxyfluorfen	G	EU: Candidate for substitution	
	Paraquat (PER85411)	L	APVMA - Currently under review Europe – deregistered Rotterdam Convention - nominated	
Pendimethalin	D	EU: Candidate for substitution		
Plant growth regulators				
	Ethephon (PER14460)			

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