



Almond

Strategic Agrichemical Review Process
(SARP)

May 2024

Hort Innovation
Project – MT23001

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MT23001 – Strategic Agrichemical Review Process (SARP) - Updates

SARP Service Provider:

AGK Services

Purpose of the report:

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

Date of report:

May 2024

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1. Summary

The strategic levy investment project Strategic Agrichemical Review Process (SARP) - Updates (MT23001) is part of the Hort Innovation Almond Fund. A Strategic Agrichemical Review Process (SARP), through the process of a desktop audit and industry liaison; Assesses the importance of the diseases, insects and weeds (plant pests) that can affect a horticultural industry;

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

1.1 Diseases

The high priority diseases are:

Disease	Priority
Hull Rot (<i>Rhizopus</i> spp.)	H
Almond Rust (<i>Tranzschelia discolor</i>)	H
Bacterial Leaf Spot (<i>Xanthomonas arboricola</i>)	H
Anthracnose (<i>Colletotrichum gloeosporioides</i>)	H

1.2 Insects and other pests

The high priority insects and other pests are:

Insects and Other Pests	Priority
Carob Moth (<i>Ectomyelois ceratoniae</i>)	H
Carpophilus Beetle (<i>Carpophilus</i> spp.)	H

1.3 Weeds

The high priority weeds are:

Weeds	Priority
Flaxleaf Fleabane (<i>Conyza bonariensis</i>)	H
Annual Ryegrass (<i>Lolium rigidum</i>)	H

1.4 Plant Growth Regulators

The high priority Plant Growth Regulator issues are:

PGR Issue	Priority
Promote nut loosening	H

2. The Australian Almond Industry

Almonds are grown in southern Australia, with most of the production occurring along the Murray River downstream of Swan Hill. The industry has a strong export focus, with 1.9 tonnes sold overseas for every tonne sold domestically. Most almonds are cracked and sold in kernel form.

Production for the year ending June 2023 was 147,687 tonnes (in-shell) or equivalent to 103,381 tonnes (kernel). The value of production was worth \$523.4 million. Almond production area is relatively stable, but production can fluctuate significantly from year to year depending on seasonal influences.

Fresh Almond Seasonality by State¹

State	22/23 Tonnes	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Victoria	54,792												
South Australia	28,947												
New South Wales	18,609												
Western Australia	1,034												
Availability Legend			Harvest				End of Harvest				None		

Almond exports are a mix of both in-shell and kernel. For the year ending June 2023, Australia exported 40,756 tonnes of in-shell almonds and 71,858 tonnes of kernel almonds. The major export destinations are China (36%), Spain (14%), Turkey (10%), Vietnam (10%) and India (7%).

¹ Hort Innovation (2024). Australian Horticulture Statistics Handbook 2022/23. [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 almond 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 almond industry regarding pesticide access, Hort Innovation has undertaken the current project to update the Strategic Agrichemical Review Process (SARP) for almonds.

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

Exotic plant pests, not present in Australia, are not addressed in this document. Biosecurity plans have been developed for the Almond 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. More information is available at this link².

² <https://www.planthealthaustralia.com.au/industries/>

3.2 Minor use permits and registration

From a pesticide access perspective, the APVMA classifies almonds as a major crop. They fit within the APVMA Crop Group 022: Tree nuts. Access to minor use permits can be achieved as long as a reasonable justification is provided in accordance to the APVMA’s minor use guidance³. Possible justification for future permit applications could be based on:

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

With each of these options, sound, scientific argument is required to justify any new permit applications. Another option for the almond industry is for manufacturers to register new pesticides uses in the crop.

3.3 Methods

The current version of the Almond Strategic Agrichemical Review Process (SARP) is the first report for the industry and 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: 6 November 2023 Survey closed: 2 February 2024
SARP data updated via a desktop audit	Updated registrations and permits Updated MRL tables Updated available and potential pesticides against low, moderate and high priority pests, including an assessment of their suitability Included information on regulatory risks from MT20007
Captured industry input	Collated and analysed survey results Consolidated and incorporated industry needs and insights

³ <https://apvma.gov.au/node/10931>

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 almond
- Appendix 2. Products available for control of insects and other pests in almond
- Appendix 3. Products available for weed control in almond
- Appendix 4. Plant Growth Regulators available in almond
- Appendix 5. Current permits for use in almond
- Appendix 6. Almond Maximum Residue Limits (MRLs)
- Appendix 7. Almond regulatory risk assessment

4. Diseases, pests and weeds of Almonds

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

Information on regulatory risk derived from project MT20007 (Chapter 4) - Regulatory support and coordination (Appendix 7) has been incorporated. Some of the suggested options have no overseas MRLs (see Appendix 6). If treated fruit is to be exported nil residues at harvest would be needed for these options. While care has been taken to ensure the accuracy of the information provided in this document the APVMA registered label and where relevant the APVMA approved permit must always be followed.

⁴ <https://www.croplife.org.au/resources/programs/resistance-management/>

4.1 Diseases of Almonds

4.1.1 Disease priorities

Disease	Priority
Hull Rot (<i>Rhizopus</i> spp.)	H
Almond Rust (<i>Tranzschelia discolor</i>)	H
Bacterial Leaf Spot (<i>Xanthomonas arboricola</i>)	H
Anthracnose (<i>Colletotrichum gloeosporioides</i>)	H
Phytophthora Root and Crown Rot (<i>Phytophthora</i> spp.)	M
Bacterial Canker (<i>Pseudomonas syringae</i>)	M
Brown Rot (<i>Monilinia laxa</i>)	M
Shot-Hole (<i>Wilsonamyces carpophilus</i>)	M
Crown Gall (<i>Agrobacterium tumefaciens</i>)	L
Verticillium Wilt (<i>Verticillium dahliae</i>)	L
Freckle and Scab (<i>Cladosporium carpophilum</i>)	L

The following diseases have been identified as high priority in our industry consultation: Hull Rot, Almond Rust, Bacterial Leaf Spot and Anthracnose.

Disease control is a major focus in almond orchards. It is recommended that an Integrated Disease Management Strategy is implemented, including a range of cultural practices to support fungicides, and potentially reduce the reliance on fungicides for disease control.

Cultural controls include:

- Biosecurity measures to prevent importing infections from other farms.
- Promoting good drainage and avoid waterlogging through irrigation.
- Canopy management to promote airflow.
- Plantation hygiene – remove dead plant material that could contain disease inoculum.
- Avoid tree stress through good nutrition and water management.

In controlling fungal and bacterial diseases, the industry should be mindful of resistance management. In addition to cultural controls, it is important to include a range of fungicide groups in a foliar spray program, including the use of protectant fungicides. Fungicide programs should be planned at the start of the season to ensure that effective disease control is achieved in conjunction with appropriate product rotation.

CropLife Australia have resistance management strategies specifically related to the control of Blossom Blight / Brown Rot⁵ and Rust⁶ in almonds, and users must refer to them before using any product.

⁵ <https://www.croplife.org.au/resources/programs/resistance-management/almonds-blossom-blight-and-brown-rot-3/>

⁶ <https://www.croplife.org.au/resources/programs/resistance-management/almond-rust/>

4.1.2 Available and potential products for priority diseases

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

Availability		Regulatory risk (refer to Appendix 7)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Hull Rot (<i>Rhizopus</i> spp.) Priority: High							
Rated as a high priority in NSW, SA, VIC & WA. Causes hulls, nuts and kernels to blacken and stick to the tree. Hull Rot reduces quality and yield, and the diseased nuts held on the tree can perpetuate the infection. An integrated disease management approach is required including cultural measures such as irrigation management, nitrogen management and strategic use of fungicides.							
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Brown Rot / Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Rust (<i>Tranzschelia discolor</i>) and for suppression of Hull Rot (<i>Rhizopus</i> & <i>Monilinia</i> spp.) Apply a single foliar application at early hull split.	R3
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot . Apply as a preventative foliar application at early (1-10%) hull split. Repeat at 50% hull split if required. Maximum of 3 applications per season.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot . Apply as a foliar application at early hull split. Repeat at the first sign of infection. Maximum of 3 applications per season.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Isopyrazam (Seguris) Syngenta	7	Protectant	14 NG	A	ALL	Registered in almonds for control of Scab (<i>Venturia carpophila</i>), Stone Fruit Rust (<i>Tranzschelia discolor</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and Shot Hole (<i>Wilsonomyces carpophilus</i>), and for suppression of Anthracnose (<i>Colletotrichum acutatum</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application, commencing at fruit ripening and continue past hull split to pre-harvest. Retreatment interval not specified. Maximum of 2 applications per season.	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	14 NG	A	ALL	Registered in almond for control of Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and for suppression of Leaf Rust (<i>Tranzschelia discolor</i>), Shot Hole (<i>Wilsonomyces carpophilus</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application at early hull split. Apply a second application 10-14 days later. Maximum number of applications not specified.	-
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Protectant	NR	A	ALL	Registered in almonds for suppression of Hull Rot (<i>Rhizopus</i> spp., <i>Botrytis</i> spp.) Apply as a protectant foliar application from early hull split through to harvest. Use a retreatment interval of 10-14 days, although this should be reduced to 7 days if rainfall occurs between treatments. Maximum of 6 applications per season.	-
<i>Aureobasidium pullulans</i> (Botector) Nufarm	UN	Biological / Protectant		P		Registered for suppression of Rhizopus Rot in berries.	-
Fludioxonil (Scholar) Syngenta	12	Protectant		P		Registered for Control of Rhizopus Rot in stone fruit.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Almond Rust (<i>Tranzschelia discolor</i>) Priority: High Rated as a high priority in NSW, SA & WA, and as a moderate priority in VIC. Rust infections occur during warm, wet weather causing spots on leaves which can expand rapidly under favourable conditions. A regular fungicide program is required to manage the disease and reduce carry over infection between seasons.							
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Brown Rot / Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Rust (<i>Tranzschelia discolor</i>) and for suppression of Hull Rot (<i>Rhizopus</i> & <i>Monilinia</i> spp.) Apply as a foliar application as part of a disease management program, commencing from late flowering and/or when the first new leaves emerge. Use a retreatment interval of 10-14 days. Maximum of 2 treatments per season.	R3
Chlorothalonil (Bravo)	M5	Protectant	NR	A	ALL (excl. QLD)	Registered in almonds for control of Shot-Hole (<i>Stigminta carpophila</i>) and Stone Fruit Rust (<i>Tranzschelia discolor</i>). Apply as a foliar application at bud-swell, bud-burst, pink bud, shuck fall and cap fall. Use a retreatment interval of 10-14 days. Maximum number of treatments per season not specified.	R3
Cyprodinil (Solaris)	9	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Blossom Blight / Brown Rot (<i>Monilinia laxa</i>), Rust (<i>Tranzschelia discolor</i>) and Shot-Hole (<i>Wilsonomyces carpophilus</i>). Apply as a foliar application from early (10%) bloom to petal fall. Use a minimum retreatment interval of 7 days. Maximum of 2 applications per season.	R3
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot. Apply as a foliar application at or prior to the first signs of disease. Repeat applications may be necessary later in the crop cycle. Retreatment interval not specified. Maximum of 3 applications per season.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot. Apply as a foliar application at or prior to the first signs of disease. Repeat applications may be necessary later in the crop cycle. Retreatment interval not specified. Maximum of 3 applications per season.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Isopyrazam (Seguris) Syngenta	7	Protectant	14 NG	A	ALL	Registered in almonds for control of Scab (<i>Venturia carpophila</i>), Stone Fruit Rust (<i>Tranzschelia disclour</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and Shot Hole (<i>Wilsonomyces carpophilus</i>), and for suppression of Anthracnose (<i>Colletotrichum acutatum</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application at or prior to the first signs of disease. Repeat applications may be necessary later in the crop cycle. Retreatment interval not specified. Maximum of 2 applications per season.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in almonds for control of Brown Rot, Rust , Shot Hole and Freckle. Apply as a foliar application at early bloom (1-10%), mid to full bloom (50-100%), petal fall and shuck fall, and then at retreatment intervals of 14 days. Maximum number of treatments per season not specified.	R2
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	14 NG	A	ALL	Registered in almond for control of Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and for suppression of Leaf Rust (<i>Tranzschelia discolor</i>), Shot Hole (<i>Wilsonomyces carpophilus</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application as part of a disease management program. Retreatment interval and maximum number of applications per season not specified.	-
Pyraclostrobin (Cabrio)	11	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Rust (<i>Tranzschelia discolor</i>). Apply as a foliar application as part of a disease management program. Commence applications at flowering and use a retreatment interval of 10-14 days. Maximum of 2 treatments per season.	-
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	21 NG	A	ALL	Registered in almond for control of Shot Hole (<i>Wilsonomyces carpophilus</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.), Leaf Rust (<i>Tranzschelia discolor</i>), Alternaria Leaf Spot (<i>Alternaria alternate</i>), Anthracnose (<i>Colletotrichum acutatum</i>) and Scab or Freckle (<i>Cladosporium carpophila</i>). Apply as a preventative foliar application as part of a disease management program. Use a retreatment interval of 10-21 days. Maximum of 3 treatments per season and no more than 2 consecutive.	-
Sulfur	M2	Protectant	NR	A	ALL	Registered in almonds for control of Freckle, Leaf Curl, Rust , Shot Hole and Brown Rot / Blossom Blight. Apply as a foliar application while trees are dormant until the bud-swell stage. Retreatment interval and maximum number of treatments per season not specified.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Dithianon (Delan) BASF	M9	Protectant / Curative		P		Registered for control of Rust in apricots, nectarines and peaches.	R3
Florypicoxamid (Verpixo Adavelt) Corteva	21	Protectant		P		Registered for control of Powdery Mildew in cucurbits and fruiting vegetables, control of Sclerotinia Rot in lettuce, and control of Grey Mould and Powdery Mildew in strawberries. Also has activity on Septoria, Anthracnose, Alternaria, Scab, Monilinia, Rust and <i>Mycosphaerella</i> spp.	-
Bacterial Leaf Spot (<i>Xanthomonas arboricola</i>)							
Priority: High							
Rated as a high priority in SA & WA, as a moderate priority in NSW, and as a low priority in VIC. Bacterial Leaf Spot is favoured by wet weather and severe infections can cause significant impacts on nut yields and quality.							
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in almonds for control of Shot-Hole and Leaf Curl (<i>Taphrina deformans</i>). Registered for control of various bacteria in stone fruit, mangoes, beans, capsicums, carnations, cucurbits, lettuce, peas and tomatoes.	-
<i>Bacillus amyloliquefaciens</i> (Serifel) BASF	BM02	Biological	NR	P		Registered for control of Botrytis in grapevines and berries. US registration for control of Xanthomonas spp. brassica leafy vegetables, citrus, fruiting vegetables, leafy vegetables, stone fruit, strawberry, root & tuber vegetables and tree nuts.	-
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Opti) Bayer	BM02	Biological	NR	P		Registered for suppression of Xanthomonas spp. in tomatoes, capsicums and chillies.	-
Acibenzolar-S-Methyl (Actigard Plant Activator) Syngenta	P01	Protectant		P		US registration for suppression of Xanthomonas spp. in brassica leafy vegetables, citrus, cucurbits, low growing berries, bulb onions, pepper and tomato.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Anthracnose (<i>Colletotrichum gloeosporioides</i>) Priority: High Rated as a high priority in NSW, VIC & WA, and as a low priority in SA. Anthracnose attacks the flowers, fruit and stems. It results in lesions on the surface of nut which can develop and infest the whole nut. Affected nuts turn into mummies and stick to the tree. Cultural measures that reduce canopy humidity will assist along with a regular fungicide program.							
Azoxystrobin (Amistar)	11	Protectant & Curative	28	A	ALL	Registered in almond for control of Anthracnose (<i>Colletotrichum acutatum</i>), Brown Rot / Blossom Blight (<i>Monilinia laxa</i>) and Shot-Hole (<i>Wilsonomyces carpophilus</i>). Apply as a foliar application from pink bud stage as part of a disease management program. Do not use consecutive applications of Group 11 fungicides. Maximum of 3 treatments per season.	-
Captan	M4	Protectant	28 NG	A	NSW, VIC & SA	Registered in almonds for control of Anthracnose (<i>Colletotrichum acutatum</i>), Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Nut Scab (<i>Cladosporium carpophilum</i>). Apply as a foliar application as part of a disease management program, commencing at petal fall followed by applications at 2-3 weeks and 4-5 weeks after petal fall. Maximum of 3 treatments per season.	-
Isopyrazam (Seguris) Syngenta	7	Protectant	14 NG	A	ALL	Registered in almonds for control of Scab (<i>Venturia carpophila</i>), Stone Fruit Rust (<i>Tranzschelia discolor</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and Shot Hole (<i>Wilsonomyces carpophilus</i>), and for suppression of Anthracnose (<i>Colletotrichum acutatum</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application commencing at fruit ripening and continue past hull split to pre-harvest. Retreatment interval not specified. Maximum of 2 applications per season.	-
Propiconazole PER12989	3	Protectant & Curative	14	A	ALL (excl. VIC)	Permitted in almonds for control of Blossom Blight (<i>Monilinia laxa</i>) and Anthracnose (<i>Colletotrichum acutatum</i>). Apply as a foliar application as part of a disease management program. Apply at pink bud, full bloom, petal fall and at 2-3 weeks and 4-6 weeks after petal fall. Do not apply after hull split. Maximum of 4 treatments per season.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	21 NG	A	ALL	Registered in almond for control of Shot Hole (<i>Wilsonomyces carpophilus</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.), Leaf Rust (<i>Tranzschelia discolor</i>), Alternaria Leaf Spot (<i>Alternaria alternata</i>), Anthracnose (<i>Colletotrichum acutatum</i>) and Scab or Freckle (<i>Cladosporium carpophila</i>). Apply as a preventative foliar application as part of a disease management program. Use a retreatment interval of 10-21 days. Maximum of 3 treatments per season and no more than 2 consecutive.	-
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in almonds for control of Shot-Hole and Leaf Curl (<i>Taphrina deformans</i>). Registered for control of Anthracnose in avocado, durians, macadamias, rambutans and lettuce.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	14 NG	P-A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot. US registration for control of Anthracnose in almonds.	R3
Fluopyram & Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant / Curative	14	P-A	ALL	Registered in almonds for control of Brown Rot, Shot-Hole and Stone Fruit Rust and suppression of Hull Rot. Registered for control of Anthracnose in tropical and sub-tropical fruit (inedible peel). US registration for control of Anthracnose in almonds.	-
<i>Aureobasidium pullulans</i> (Botector) Nufarm	UN	Biological / Protectant	NR	P		Registered for suppression of Anthracnose in berries and grapes.	-
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Opti) Bayer	BM 02	Biological / Protectant	NR	P		Registered for control of Anthracnose in avocado and mango. US registration for control of Anthracnose in tree nuts.	-
BLAD (Problad Plus)	BM 01	Biological	NR	P		Registered for suppression of Brown Rot in stone fruit. US registration for control of Brown Rot / Blossom Blight in almonds and control of Anthracnose in grapes and strawberries.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Cyprodinil + Fludioxonil (Switch) Syngenta	9+12	Protectant		P		Registered for control of Anthracnose in nursery stock, ornamentals and strawberries. US registration for control of Anthracnose in berries, citrus and tropical fruit.	R3
Florypicoxamid (Verpixo Adavelt) Corteva	21	Protectant		P		Registered for control of Powdery Mildew in cucurbits and fruiting vegetables, control of Sclerotinia Rot in lettuce, and control of Grey Mould and Powdery Mildew in strawberries. Also has activity on Septoria, Anthracnose , Alternaria, Scab, Monilinia, Rust and <i>Mycosphaerella</i> spp.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Curative / Protectant		P		Registered for control of Grey Mould in berries, Grey Mould and Powdery Mildew in strawberries and grapes, and Grey Mould and Sclerotinia in lettuce and leafy vegetables. US registration for control of Anthracnose in almonds, bushberries, grapes & small fruit vine climbing (except Fuzzy Kiwifruit), lemon, lime, low-growing berries and specific tree nuts.	R3
Phytophthora Root and Crown Rot (<i>Phytophthora</i> spp.)							
Priority: Moderate							
Rated as a high priority in NSW, and as a moderate priority in SA, VIC & WA. Phytophthora Root and Crown Rot can have devastating impacts on trees including death in severe cases. Ensure good drainage and irrigation management to reduce the risk of infection.							
Metalaxyl-M (Ridomil Gold) PER94212	4	Protectant & Curative	42 NG	A	ALL	Permitted in almond for control of Collar Rot, Crown Rot & Root Rot (<i>Phytophthora</i> spp.) Apply as a soil spray (broadcast, band or irrigation) to the entire area under the tree canopy. Apply 2 weeks after planting (new plantings) or at the beginning of summer before growth begins (established plantings). Additional applications may be made at 3-6 month intervals. Use a minimum retreatment interval of 60 days. Maximum of 3 treatments per season, apply in alternate years only.	-
Phosphorous Acid	33	Protectant & Curative	28	A	ALL	Registered in almonds for suppression of Phytophthora spp. Apply either as a foliar application or through the irrigation water. Do not apply after hull split. Retreatment interval not specified. Maximum of 2 treatments per season.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime) Bayer	BM 02	Biological Soil Ameliorant	NR	P-A	ALL	Available in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Registered for suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in almonds for control of Shot-Hole and Leaf Curl (<i>Taphrina deformans</i>). Registered for control of Phytophthora in avocado, citrus, kiwifruit, litchi, nectarines, passionfruit, plums, peaches, pecans and tropical fruit.	-
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.	-
Oxathiapiprolin (Zorvec Enicade) Corteva	49	Protectant / Curative		P		Registered for control of Downy Mildew in bulb vegetables, brassicas, cucurbits, leafy vegetables and poppies. Permitted for control of Phytophthora Root Rot in raspberries and blackberries. US registration for control of Phytophthora Canker and Brown Rot in citrus.	-
Bacterial Canker (<i>Pseudomonas syringae</i>)							
Priority: Moderate							
Rated as a moderate priority in NSW, SA, VIC & WA.							
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in almonds for control of Shot-Hole and Leaf Curl (<i>Taphrina deformans</i>). Registered for control of various bacteria in stone fruit, mangoes, beans, capsicums, carnations, cucurbits, lettuce, peas and tomatoes.	-
<i>Bacillus amyloliquefaciens</i> (Serenade Opti) Bayer	BM 02	Biological	NR	P		Registered for control of various diseases in grapevines, strawberries, fruiting vegetables and tropical fruit crops (excl. bananas), including suppression of Bacterial Spot in fruiting vegetables.	-
<i>Bacillus amyloliquefaciens</i> strain MBI 600	BM 02	Biological	NR	P		Registered in grapevines and strawberries for control of Botrytis. US registration for control of various bacterial infections in berries, fruiting vegetables, leafy vegetables, stone fruit, root & tuber vegetables and tree nuts.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
(Serifel) BASF							
Brown Rot / Blossom Blight (<i>Monilinia laxa</i>)							
Priority: Moderate							
Rated as a high priority in WA, as a moderate priority in VIC, and as a low priority in NSW & SA. Brown Rot infection occurs at flowering and damage is caused to yield through loss of blooms at this time. A planned fungicide program during flowering is critical for management of Brown Rot.							
Azoxystrobin (Amistar)	11	Protectant & Curative	28	A	ALL	Registered in almond for control of Anthracnose (<i>Colletotrichum acutatum</i>), Brown Rot / Blossom Blight (<i>Monilinia laxa</i>) and Shot-Hole (<i>Wilsonomyces carpophilus</i>). Apply as a foliar application from budswell as part of a disease management program. Use a retreatment interval of 7-14 days. Do not use consecutive applications of Group 11 fungicides. Maximum of 3 treatments per season.	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Brown Rot / Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Rust (<i>Tranzschelia discolor</i>) and for suppression of Hull Rot (<i>Rhizopus</i> & <i>Monilinia</i> spp.) Apply as a foliar application as part of a disease management program, commencing from budswell. Use a retreatment interval of 10-14 days. Maximum of 3 treatments per season, and no consecutive applications of Group 11 fungicides.	R3
Captan	M4	Protectant	28 NG	A	NSW, VIC & SA	Registered in almonds for control of Anthracnose (<i>Colletotrichum acutatum</i>), Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Nut Scab (<i>Cladosporium carpophilum</i>). Apply as a foliar application as part of a disease management program, commencing at petal fall followed by applications at 2-3 weeks and 4-5 weeks after petal fall. Maximum of 3 treatments per season.	-
Cyprodinil (Solaris)	9	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Blossom Blight / Brown Rot (<i>Monilinia laxa</i>), Rust (<i>Tranzschelia discolor</i>) and Shot-Hole (<i>Wilsonomyces carpophilus</i>). Apply as a foliar application from budswell to petal fall. Use a minimum retreatment interval of 7 days. Maximum of 2 applications per season.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight , Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot. Apply as a preventative foliar application at early (1-10%) blossom, full bloom and petal fall / shuck fall. Retreatment interval not specified. Maximum of 3 applications per season.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight , Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot. Apply as a preventative foliar application at early (1-10%) blossom, full bloom and petal fall / shuck fall. Retreatment interval not specified. Maximum of 3 applications per season.	-
Iprodione (Rovral)	2	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) Apply as a foliar application commencing at first bloom and followed by subsequent applications at petal fall and up to 4 weeks after petal fall. Maximum number of treatments not specified.	R2
Isopyrazam (Seguris) Syngenta	7	Protectant	14 NG	A	ALL	Registered in almonds for control of Scab (<i>Venturia carpophila</i>), Stone Fruit Rust (<i>Tranzschelia discolor</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and Shot Hole (<i>Wilsonomyces carpophilus</i>), and for suppression of Anthracnose (<i>Colletotrichum acutatum</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application, commencing at fruit ripening and continue past hull split to pre-harvest. Retreatment interval not specified. Maximum of 2 applications per season.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in almonds for control of Brown Rot , Rust, Shot Hole and Freckle. Apply as a foliar application at early bloom (1-10%), mid to full bloom (50-100%), petal fall and shuck fall, and then at retreatment intervals of 14 days. Maximum number of treatments per season not specified.	R2
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	14 NG	A	ALL	Registered in almond for control of Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and for suppression of Leaf Rust (<i>Tranzschelia discolor</i>), Shot Hole (<i>Wilsonomyces carpophilus</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application as part of a disease management program, commencing at early bloom and continuing through to petal fall / shuck fall. Use a retreatment interval of 10-14 days. Maximum number of treatments per season not specified.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Penthiopyrad (Fontelis) Corteva	7	Protectant	14 NG	A	ALL	Registered in almonds for control of Brown Rot / Blossom Blight (<i>Monilinia</i> spp.) Apply as a foliar application prior to disease development. Use a retreatment interval of 7-14 days. Maximum of 3 applications per season, with no more than 2 sequential applications.	-
Propiconazole PER12989	3	Protectant & Curative	14	A	ALL (excl. VIC)	Permitted in almonds for control of Blossom Blight (<i>Monilinia laxa</i>) and Anthracnose (<i>Colletotrichum acutatum</i>). Apply as a foliar application as part of a disease management program. Apply at pink bud, full bloom, petal fall and at 2-3 weeks and 4-6 weeks after petal fall. Do not apply after hull split. Maximum of 4 treatments per season.	R3
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	21 NG	A	ALL	Registered in almond for control of Shot Hole (<i>Wilsonomyces carpophilus</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.), Leaf Rust (<i>Tranzschelia discolor</i>), Alternaria Leaf Spot (<i>Alternaria alternata</i>), Anthracnose (<i>Colletotrichum acutatum</i>) and Scab or Freckle (<i>Cladosporium carpophila</i>). Apply as a preventative foliar application as part of a disease management program. Use a retreatment interval of 10-21 days. Maximum of 3 treatments per season and no more than 2 consecutive.	-
Sulfur	M2	Protectant	NR	A	ALL (excl. WA)	Registered in almonds for control of Freckle, Leaf Curl, Rust, Shot Hole and Brown Rot / Blossom Blight . Apply as a foliar application while trees are dormant until the bud-swell stage. Retreatment interval and maximum number of treatments per season not specified.	-
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in almonds for control of Shot-Hole and Leaf Curl (<i>Taphrina deformans</i>). Registered for control of Brown Rot in stone fruit.	-
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Opti) Bayer	BM02	Biological	NR	P		Registered for control of Botrytis in grapevines and strawberries, Anthracnose and Stem End Rot in avocado and other tropical fruits (excluding banana), and suppression of Bacterial Spot in tomatoes, capsicums and chillies. US registration for control of Brown Rot in tree nuts.	-
BLAD (Problad Plus)	BM 01	Biological	NR	P		Registered for suppression of Brown Rot in stone fruit. US registration for control of Brown Rot / Blossom Blight in almonds.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Florypicoxamid (Verpixo Adavelt) Corteva	21	Protectant		P		Registered for control of Powdery Mildew in cucurbits and fruiting vegetables, control of Sclerotinia Rot in lettuce, and control of Grey Mould and Powdery Mildew in strawberries. Also has activity on Septoria, Anthracnose, Alternaria, Scab, Monilinia , Rust and <i>Mycosphaerella</i> spp.	-
Potassium Silicate + Potassium Bicarbonate (EcoCarb Plus) OCP	M2	Protectant		P		Registered for control of Brown Rot in nectarines.	-
Shot-Hole (<i>Wilsonomyces carpophilus</i>)							
Priority: Moderate							
Rated as a moderate priority in NSW, VIC & WA, and as a low priority in SA. Shot-Hole affects all above-ground plant parts, but symptoms are most noticeable as lesions that develop into holes on the leaves. Incidence of the disease is very high in almonds although it is not thought to have a big impact on yield, partly as a result of regular fungicide programs to manage infections.							
Azoxystrobin (Amistar)	11	Protectant & Curative	28	A	ALL	Registered in almond for control of Anthracnose (<i>Colletotrichum acutatum</i>), Brown Rot / Blossom Blight (<i>Monilinia laxa</i>) and Shot-Hole (<i>Wilsonomyces carpophilus</i>). Apply as a foliar application from budswell as part of a disease management program. Use a retreatment interval of 7-14 days. Do not use consecutive applications of Group 11 fungicides. Maximum of 3 treatments per season.	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Brown Rot / Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Rust (<i>Tranzschelia discolor</i>) and for suppression of Hull Rot (<i>Rhizopus</i> & <i>Monilinia</i> spp.) Apply as a foliar application as part of a disease management program, commencing from budswell. Use a retreatment interval of 10-14 days. Maximum of 3 treatments per season, and no consecutive applications of Group 11 fungicides.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Captan	M4	Protectant	28 NG	A	NSW, VIC & SA	Registered in almonds for control of Anthracnose (<i>Colletotrichum acutatum</i>), Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Nut Scab (<i>Cladosporium carpophilum</i>). Apply as a foliar application as part of a disease management program, commencing at petal fall followed by applications at 2-3 weeks and 4-5 weeks after petal fall. Maximum of 3 treatments per season.	-
Chlorothalonil (Bravo)	M5	Protectant	NR	A	ALL (excl. QLD)	Registered in almonds for control of Shot-Hole (<i>Stigmina carpophila</i>) and Stone Fruit Rust (<i>Tranzschelia discolor</i>). Apply as a foliar application at bud-swell, bud-burst, pink bud, shuck fall and cap fall. Use a retreatment interval of 10-14 days. Maximum number of treatments per season not specified.	R3
Copper (Cu)	M1	Protectant	1	A	ALL	Registered in almonds for control of Shot-Hole and Leaf Curl (<i>Taphrina deformans</i>). Apply as a foliar spray when buds are swelling, but before and within 1 week of bud opening. Retreatment interval and maximum number of treatments not specified.	-
Cyprodinil (Solaris)	9	Protectant & Curative	NR	A	ALL	Registered in almonds for control of Blossom Blight / Brown Rot (<i>Monilinia laxa</i>), Rust (<i>Tranzschelia discolor</i>) and Shot-Hole (<i>Wilsonomyces carpophilus</i>). Apply as a foliar application from budswell to petal fall. Use a minimum retreatment interval of 7 days. Maximum of 2 applications per season.	R3
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole , and for suppression of Hull Rot. Apply as a preventative foliar application at starting at early pink bud. Use a retreatment interval of 10-14 days. Maximum of 3 applications per season.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	14 NG	A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole , and for suppression of Hull Rot. Apply as a preventative foliar application at starting at early pink bud. Use a retreatment interval of 10-14 days. Maximum of 3 applications per season.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Isopyrazam (Seguris) Syngenta	7	Protectant	14 NG	A	ALL	Registered in almonds for control of Scab (<i>Venturia carpophila</i>), Stone Fruit Rust (<i>Tranzschelia discolor</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and Shot Hole (<i>Wilsonomyces carpophilus</i>), and for suppression of Anthracnose (<i>Colletotrichum acutatum</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application, commencing at early blossom and continue past hull split to pre-harvest. Retreatment interval not specified. Maximum of 2 applications per season.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in almonds for control of Brown Rot, Rust, Shot Hole and Freckle. Apply as a foliar application at early bloom (1-10%), mid to full bloom (50-100%), petal fall and shuck fall, and then at retreatment intervals of 14 days. Maximum number of treatments per season not specified.	R2
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	14 NG	A	ALL	Registered in almond for control of Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and for suppression of Leaf Rust (<i>Tranzschelia discolor</i>), Shot Hole (<i>Wilsonomyces carpophilus</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application as part of a disease management program, commencing at early bloom and continuing through to petal fall / shuck fall. Use a retreatment interval of 10-14 days. Maximum number of treatments per season not specified.	-
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	21 NG	A	ALL	Registered in almond for control of Shot Hole (<i>Wilsonomyces carpophilus</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.), Leaf Rust (<i>Tranzschelia discolor</i>), Alternaria Leaf Spot (<i>Alternaria alternate</i>), Anthracnose (<i>Colletotrichum acutatum</i>) and Scab or Freckle (<i>Cladosporium carpophila</i>). Apply as a preventative foliar application as part of a disease management program. Use a retreatment interval of 10-21 days. Maximum of 3 treatments per season and no more than 2 consecutive.	-
Sulfur	M2	Protectant	NR	A	ALL	Registered in almonds for control of Freckle, Leaf Curl, Rust, Shot Hole and Brown Rot / Blossom Blight. Apply as a foliar application while trees are dormant until the bud-swell stage. Retreatment interval and maximum number of treatments per season not specified.	-

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	NR	P		Registered for control of Botrytis in grapevines and strawberries, Anthracnose and Stem End Rot in avocado and other tropical fruits (excluding banana), and suppression of Bacterial Spot in tomatoes, capsicums and chillies. US registration for control of Shot Hole in tree nuts.	-
Crown Gall (<i>Agrobacterium tumefaciens</i>)							
Priority: Low							
Rated as a low priority in NSW, SA, VIC & WA. Crown Gall can cause tumours and galls on the lower stems and roots.							
<i>Rhizobium rhizogenes</i> strain K1026/g (NoGall)	-	Protectant	NR	A	ALL	Registered in almonds for control of Crown Gall . Apply as a solution at planting to seeds, seedlings or cuttings.	-
Verticillium Wilt (<i>Verticillium dahliae</i>)							
Priority: Low							
Rated as a low priority in NSW, SA, VIC & WA. Verticillium is a soil-borne fungus that can persist for many years. Its effects are not severe, but it can impact on plant health over an extended period. New plantings should not be made in areas that are infested with Verticillium.							
Chloropicrin + 1,3-Dichloropropene	8B	Protectant / Fumigant	NR	A	ALL	Registered in nut crops as a soil fumigant for control of soil-borne diseases (including <i>Fusarium</i> & Verticillium Wilts, <i>Rhizoctonia</i> , <i>Pythium</i>). For use by professional and registered fumigators only.	-
<i>Bacillus amyloliquefaciens</i> Strain QST 713 (Serenade Prime) Bayer	BM 02	Biological Soil Ameliorant	NR	P-A	ALL	Available in tree crops for application to soil to improve bioavailability of soil resources to horticultural crops. Registered for suppression of soil-borne diseases such as Black Scurf in potatoes and Pineapple Disease in sugarcane.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Freckle and Scab (<i>Cladosporium carpophilum</i>) Priority: Low Rated as a low priority in NSW, SA, VIC & WA. Freckle / Scab is an infrequent disease in almonds.							
Captan	M4	Protectant	28 NG	A	NSW, VIC & SA	Registered in almonds for control of Anthracnose (<i>Colletotrichum acutatum</i>), Blossom Blight (<i>Monilinia laxa</i>), Shot-Hole (<i>Wilsonomyces carpophilus</i>) and Nut Scab (<i>Cladosporium carpophilum</i>). Apply as a foliar application as part of a disease management program, commencing at petal fall followed by applications at 2-3 weeks and 4-5 weeks after petal fall. Maximum of 3 treatments per season.	-
Isopyrazam (Seguris) Syngenta	7	Protectant	14 NG	A	ALL	Registered in almonds for control of Scab (<i>Venturia carpophila</i>), Stone Fruit Rust (<i>Tranzschelia discolor</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and Shot Hole (<i>Wilsonomyces carpophilus</i>), and for suppression of Anthracnose (<i>Colletotrichum acutatum</i>) and Hull Rot (<i>Rhizopus</i> spp.) Apply as a foliar application, commencing at fruit ripening and continue past hull split to pre-harvest. Retreatment interval not specified. Maximum of 2 applications per season.	-
Mancozeb	M3	Protectant	14	A	ALL	Registered in almonds for control of Brown Rot, Rust, Shot Hole and Freckle . Apply as a foliar application at early bloom (1-10%), mid to full bloom (50-100%), petal fall and shuck fall, and then at retreatment intervals of 14 days. Maximum number of treatments per season not specified.	R2
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Protectant & Curative	21 NG	A	ALL	Registered in almond for control of Shot Hole (<i>Wilsonomyces carpophilus</i>), Blossom Blight / Brown Rot (<i>Monilinia</i> spp.), Leaf Rust (<i>Tranzschelia discolor</i>), Alternaria Leaf Spot (<i>Alternaria alternate</i>), Anthracnose (<i>Colletotrichum acutatum</i>) and Scab or Freckle (<i>Cladosporium carpophila</i>). Apply as a preventative foliar application as part of a disease management program. Use a retreatment interval of 10-21 days. Maximum of 3 treatments per season and no more than 2 consecutive.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Sulfur	M2	Protectant	NR	A	ALL	Registered in almonds for control of Freckle , Leaf Curl, Rust, Shot Hole and Brown Rot / Blossom Blight. Apply as a foliar application while trees are dormant until the bud-swell stage. Retreatment interval and maximum number of treatments per season not specified.	-
Azoxystrobin (Amistar)	11	Protectant & Curative	28	P-A	ALL	Registered in almond for control of Anthracnose (<i>Colletotrichum acutatum</i>), Brown Rot / Blossom Blight (<i>Monilinia laxa</i>) and Shot-Hole (<i>Wilsonomyces carpophilus</i>). US registration for control of Cladosporium in almonds.	-
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in almonds for control of Shot-Hole and Leaf Curl (<i>Taphrina deformans</i>). Registered for control of Cladosporium in stone fruit.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	14 NG	P-A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot. US registration for control of Scab in almonds.	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Protectant & Curative	14 NG	P-A	ALL	Registered in almonds for control of Blossom Blight, Stone Fruit Rust and Shot-Hole, and for suppression of Hull Rot. US registration for control of Scab in almonds.	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	14 NG	P-A	ALL	Registered in almond for control of Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) and for suppression of Leaf Rust (<i>Tranzschelia discolor</i>), Shot Hole (<i>Wilsonomyces carpophilus</i>) and Hull Rot (<i>Rhizopus</i> spp.) US registration for control of Scab in tree nuts.	-
Florypicoxamid (Verpixo Adavelt) Corteva	21	Protectant		P		Registered for control of Powdery Mildew in cucurbits and fruiting vegetables, control of Sclerotinia Rot in lettuce, and control of Grey Mould and Powdery Mildew in strawberries. Also has activity on Septoria, Anthracnose, Alternaria, Scab , Monilinia, Rust and <i>Mycosphaerella</i> spp.	-

4.2 Insect and other pests of Almonds

4.2.1 Insect and other pest priorities

Insects and Other Pests	Priority
Carob Moth (<i>Ectomyelois ceratoniae</i>)	H
Carpophilus Beetle (<i>Carpophilus</i> spp.)	H
Bryobia Mite (<i>Bryobia praetiosa</i>)	M
Two Spotted Mite (<i>Tetranychus urticae</i>)	M
Earwigs (Dermaptera)	M
Black Peach Aphid (<i>Brachycaudus persicae</i>)	M
Brown Almond Mite (<i>Bryobia rubrioculus</i>)	L
Almond Moth (<i>Ephestia cautella</i>)	L
Slugs and Snails (Gastropoda)	L
Green Peach Aphid (<i>Myzus persicae</i>)	L
Ants (Formicidae)	L
Light Brown Apple Moth (<i>Epiphyas postvittana</i>)	L
Indian Meal Moth (<i>Plodia interpunctella</i>)	L
Apple Weevil (<i>Otiorhynchus cribricollis</i>)	L

Almonds are impacted by a wide variety of insect and other pests, with Carob Moth and Carpophilus Beetle rated as high priority pests.

It is important to take an Integrated Pest Management (IPM) Approach to pest control in almonds. The diversity of insects that will attack these crops mean that a planned, strategic approach is required. 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.

The diverse range of insect and mite pests in almonds necessitates careful planning with resistance management. Growers should refer to resistance management strategies listed on the CropLife website⁷ when planning their pest management programs.

⁷ <https://www.croplife.org.au/resources/programs/resistance-management/>

4.2.2 Available and potential products for priority insects and other pests

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

Availability		Regulatory risk (refer to Appendix 7)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG
IPM – indicative overall impact on beneficials (based on the Cotton Pest Management Guide 2019-20 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
Carob Moth (<i>Ectomyelois ceratoniae</i>)								
Priority: High								
Rated as a high priority in NSW, SA, VIC & WA. Carob Moth larvae feed on the developing kernels, making them unsuitable for sale as whole kernels. The larvae like to develop in nut mummies so the removal of these from trees is key part of managing the pest.								
Chlorantraniliprole (Altacor)	28	Ingestion	14 NG	A	ALL	Registered in almonds for control of Carob Moth (<i>Ectomyelois ceratoniae</i>) . Apply by targeting mummies through moth trapping, or when 1-5% of almond hull sutures are opening. Use a minimum retreatment interval of 7 days. Maximum of 2 applications per season.	L Bee:VL	-
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	14 NG	A	ALL	Registered in almond for control of Carob Moth and Carpophilus Beetle. For a 2 spray program, apply at the start of hull split (5-10%) and at 40-50% hull split. Use a minimum retreatment interval of 14 days. For a single spray program, apply at 10-40% hull split. Maximum of 2 applications per season.	M Bee:VH	R2
Methoxyfenozide (Prodigy)	18	Ingestion / IGR	7 NG	A	ALL	Registered in almonds for control of Carob Moth . Apply to one generation of the pest only, either as an early post-flower application or as a hull-split application. Use a minimum retreatment interval of 10 days. Maximum of 3 treatments per season.	VL Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinetoram (Delegate) Corteva	5	Ingestion	7 NG	A	ALL	Registered in almonds for control of Carob Moth . Applications should be made early post-flower (when field scouting indicates egg laying and newly hatched larvae) and at hull-split. Use a minimum retreatment interval of 7 days. Maximum of 4 treatments per season.	M Bee:VH	-
Tetraniliprole (Vayego 200SC) Bayer	28	Ingestion	10 NG	A	ALL	Registered in almond for control of Carpophilus Beetle (<i>Carpophilus near dimidiatus</i>) and Carob Moth (<i>Ectomyelois ceratoniae</i>). Apply if pest numbers exceed threshold in late spring and / or at early hull split. Retreatment interval not specified. Maximum of 2 treatments per season.	L-M Bee:VH	-
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
<i>Bacillus thuringiensis</i> (DiPEL)	11C	Biological / Ingestion	NR	P		Registered for control of various lepidopteran pests in fruit, herb, ornamental, turf, vegetable and vine crops.	VL Bee:VL	-
Emamectin (Proclaim) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potato), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, cucurbits, legume vegetables, fruiting vegetables and grapes.	M Bee:H	-
Indoxacarb (Avatar) FMC	22A	Ingestion		P		Registered for control of various lepidopteran pests in asparagus, brassica vegetables, leafy vegetables, fruiting vegetables, celery, cucurbits, sweet corn, blueberries, <i>Rubus</i> spp., pome fruit, stone fruit, strawberries, grapes and macadamia.	M Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	H Bee:VH	-
Tebufenozide (Mimic) Corteva	16A	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, kiwifruit, longan, lychee and macadamia.	L Bee:L	-
<p>Carpophilus Beetle (<i>Carpophilus</i> spp.) Priority: High Rated as a high priority in NSW, SA & VIC, and as a low priority in WA. Carpophilus Beetle damage is most severe as the nut matures, with beetles penetrating the nut and causing indirect damage by creating an entry point for Brown Rot. Beetle populations can develop rapidly as the pest is highly mobile. The Attract and Kill system is the most effective way of reducing the impact of Carpophilus beetle.</p>								
Bifenthrin (Talstar) PER87216	3A	Contact	7	A	ALL	Permitted in almonds for control of Carpophilus Beetle / Dried Fruit Beetle (<i>Carpophilus</i> spp.) Apply initial foliar spray at almond split stage. Use a minimum retreatment interval of 7 days. Maximum of 2 applications per season.	VH Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
1. BeetleJuice A – containing a mixture of ethanol, ethyl acetate, 2-methyl-1-propanol, 2-methyl-1-butanol and 3-methyl-1-butanol 2. BeetleJuice B – containing a mixture of ethanol and acetaldehyde 3. BeetleJuice Pheromone Lure (BeetleJuice Carpophilus Trapping System) PER14866	-	Attractant	NR	A	ALL	Permitted in almonds for monitoring and management of Carpophilus Beetle . Contains 2 feeding attractants and an aggregation pheromone lure, which are prepared and/or placed into a trap. To be used in conjunction with Pest Strips containing dichlorvos. <u>For Monitoring:</u> Prior to fruit ripening, place 2 traps per block where block is <10ha, or 4 traps per block where block is >10ha. Install at eye level in the plantation. Replace co-attractants every 2 weeks. Do not use aggregation pheromones. <u>For population management:</u> Prior to fruit ripening, place 3 traps per ha. Install traps external to the plantation along the perimeter and placed upwind. Replace co-attractants every 2 weeks. Use aggregation pheromone lure.	-	-
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	14 NG	A	ALL	Registered in almond for control of Carob Moth and Carpophilus Beetle . For a 2 spray program, apply at the start of hull split (5-10%) and at 40-50% hull split. Use a minimum retreatment interval of 14 days. For a single spray program, apply at 10-40% hull split. Maximum of 2 applications per season.	M Bee:VH	R2
Tetraniliprole (Vayego 200SC) Bayer	28	Ingestion	10 NG	A	ALL	Registered in almond for control of Carpophilus Beetle (<i>Carpophilus near dimidiatus</i>) and Carob Moth (<i>Ectomyelois ceratoniae</i>). Apply as a foliar application at early to mid-hull split. Use a retreatment interval of 14-21 days if required. Maximum of 2 treatments per season.	L-M Bee:VH	-
Indoxacarb (Avatar) FMC	22A	Ingestion		P		Registered for control of various beetle species, including Garden Weevil in asparagus, strawberries and grapes, Vegetable Weevil in celery, Apple Weevil, Fuller’s Rose Weevil and Garden Weevil in pome fruit and stone fruit, and Macadamia Seed Weevil in macadamia.	M Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Bryobia Mite (<i>Bryobia praetiosa</i>) Two Spotted Mite (<i>Tetranychus urticae</i>) Brown Almond Mite (<i>Bryobia rubrioculus</i>) Priority: Moderate Bryobia Mite is rated as a high priority in WA, as a moderate priority in NSW & VIC, and as a low priority in SA. Two Spotted Mite is rated as a high priority in NSW, as a moderate priority in SA, and as a low priority in VIC & WA. Brown Almond Mite is rated as a moderate priority in NSW, and as a low priority in SA, VIC and WA. Almonds can tolerate moderate numbers of mites, particularly if beneficial insects are abundant in the orchard. Management should include regular monitoring and careful use of non-disruptive miticides.								
Abamectin	6	Contact & Ingestion	28	A	ALL	Registered in almond for control of Two Spotted Mite (<i>Tetranychus urticae</i>) and Brown Almond Mite (<i>Bryobia rubrioculus</i>). Apply as a foliar application when numbers exceed threshold. Maximum of 1 treatment per season and should not be applied in 2 consecutive seasons without an alternate mode-of-action miticide being used in between.	M Bee:H	-
Bifenazate (Acramite)	20D	Contact & Ingestion	14 G:28	A	ALL	Registered in almonds for control of Two Spotted Mite (<i>Tetranychus urticae</i>) and Bryobia Mite (<i>Bryobia rubrioculus</i>). Apply as a foliar application at the first signs of mite infestation. Maximum of 1 treatment per season.	L Bee:H	-
Clofentezine (Apollo)	10A	IGR / Contact	35 NG	A	ALL	Registered in almonds for control of Two Spotted Mite (<i>Tetranychus urticae</i>) and Brown Almond Mite (<i>Bryobia rubrioculus</i>). Apply as a foliar application to recently hatched overwintering eggs. Do not apply after hull split. Maximum of 1 treatment per season.	L Bee:L	-
Cyflumetofen (Danisaraba) BASF	25A	Contact	7 NG	A	ALL	Registered in almonds for control of Two Spotted Mite (<i>Tetranychus urticae</i>), European Red Mite (<i>Panonychus ulmi</i>) and Bryobia Mite (<i>Bryobia</i> spp.) Apply as a foliar application when pest population reaches threshold. Use a retreatment interval of 14 days if necessary. Maximum of 2 treatments per season.	L Bee:L	-
Etoxazole (Paramite) Sumitomo	10B	IGR / Contact	14 NG	A	ALL	Registered in almonds for control of Two Spotted Mite (<i>Tetranychus urticae</i>), European Red Mite (<i>Panonychus ulmi</i>) and Bryobia Mite (<i>Bryobia</i> spp.) Apply as a foliar application at the first signs of mite crawlers. Maximum of 1 application per season.	L Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Etoxazole + Piperonyl Butoxide (Motto) Imtrade	10B	IGR / Contact				Registered in almonds for control of Two Spotted Mite (<i>Tetranychus urticae</i>) and European Red Mite (<i>Panonychus ulmi</i>). Apply as a foliar application at the first signs of mite crawlers. Maximum of 1 application per season.	L Bee:VL	-
Petroleum Oil	-	Contact	NR	A	ALL (excl. QLD)	Registered in almonds for control of Aphids (eggs) and Mites (eggs). Apply as a foliar spray to dormant trees. Retreatment interval and maximum number of treatments per season not specified.	L Bee:L	-
					ALL (excl. QLD, TAS)	Registered in almonds for control of San Jose Scale, Mites & Scale. Apply as a foliar application during summer growth period or post-harvest. Retreatment interval and maximum number of treatments per season not specified.		
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in nut trees for control of Aphids, Thrips, Mealybug, Two-Spotted Mite , Spider Mite & Whitefly. Apply as a cover spray. Treatments per season not limited.	L Bee:L	-
Sulfur	M2	Contact	NR	A	ALL	Registered in almonds for control of Bryobia Mite (<i>Bryobia rubrioculus</i>). Apply as a foliar application when trees are dormant up until the bud-swell stage. Retreatment interval and maximum number of applications not specified.	-	-
Acequinocyl (Kanemite) UPL	20B	Contact & Ingestion		P		Registered for control of Two-Spotted Mite in pome fruit and stone fruit. US registration for control of Spider Mite in low growing berries.	L Bee:L	-
<i>Beauveria bassiana</i> (Velifer) BASF	UN	Ingestion		P		Biological currently registered in protected vegetables and ornamentals, with activity on mites.	L Bee:L	-
Fenbutatin Oxide (Torque) BASF	12B	Contact		P		Registered for control of Two Spotted Mite and Bryobia Mite in apples, pears, peaches, nectarines and for control of Two Spotted Mite in hops, bananas, strawberries and ornamentals.	L Bee:L	R2
Hexythiazox (Calibre) Nufarm	10A	Contact / IGR		P		Registered for control of Two Spotted Mite in apples, pears, stone fruit, strawberries and ornamentals.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	H Bee:VH	-
Spiromesifen (Oberon) Bayer	23	Ingestion		P		Registration pending for control of Mites in various crops. Hort Innovation is undertaking data generation projects across multiple commodities for a new label registration in Australia.	M Bee:VL	-
Earwigs (Dermaptera)								
Priority: Moderate								
Rated as a moderate priority in SA & VIC, and as a low priority in NSW & WA. Earwigs only pose a threat to young trees. They can kill seedlings by feeding on the young shoots.								
Broflanilide (Cimegra) BASF	30	Contact & Ingestion		P		Registered for control of Diamondback Moth in brassica vegetables and brassica leafy vegetables. It also has potential uses as a seed treatment for the control of Wireworms and other soil pests, and a foliar treatment for the control of chewing pests in various crops.	H Bee:VH	-
Indoxacarb (Avatar) FMC	22A	Ingestion		P		Registered for control of Earwigs in stone fruit and strawberries.	M Bee:H	R3
Black Peach Aphid (<i>Brachycaudus persicae</i>)								
Priority: Moderate								
Rated as a moderate priority in NSW, SA & VIC, and as a low priority in WA. Black Peach Aphid are a sporadic pest in almonds.								
Petroleum Oil	-	Contact	NR	A	ALL (excl. QLD)	Registered in almonds for control of Aphids (eggs) and Mites (eggs). Apply as a foliar spray to dormant trees. Retreatment interval and maximum number of treatments per season not specified.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in nut trees for control of Aphids , Thrips, Mealybug, Two-Spotted Mite, Spider Mite & Whitefly. Apply as a cover spray. Treatments per season not limited.	L Bee:L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in almonds for control of Aphids (including Black Peach Aphid & Green Peach Aphid). Apply as a foliar application when pest population reaches threshold. Use a retreatment interval of 14 days if required. Maximum of 2 treatments per season.	M Bee:VH	R3
Pirimicarb (Aphidex)	1A	Contact	28	P-A	ALL	Registered in almonds for control of Green Peach Aphid (<i>Myzus persicae</i>).	VL Bee:VL	R3
Pymetrozine (Chess)	9B	Contact & Ingestion	28	P-A	ALL	Registered in almonds for control of Green Peach Aphid (<i>Myzus persicae</i>).	L Bee:VL	R3
Afidopyropen (Versys) BASF	9D	Ingestion		P		Registered for control of various aphid species in sweet corn, rhubarb, artichokes, brassica vegetables, celery, cucurbits, fruiting vegetables, strawberry, leafy vegetables, brassica leafy vegetables, parsley, potato, sweet potato, ginger and ornamentals.	L Bee:L	-
<i>Beauveria bassiana</i> (Velifer) BASF	UN	Biological		P		Registered for suppression of various aphids in protected vegetables and ornamentals.	L Bee:L	-
Cyantranilprole (Benevia) FMC	28	Ingestion		P		Registered for suppression of Green Peach Aphid in fruiting vegetables and potatoes, control of Melon Aphid in cucurbits, and control of Green Peach Aphid, Melon Aphid and Strawberry Aphid in strawberries.	L-M Bee:VH	-
Dimpropridaz (Efficon) BASF	UN	Contact & Ingestion		P		Registered for control of various aphids in cucurbits, brassica vegetables, leafy vegetables, brassica leafy vegetables and cotton.	M Bee:L	-
Flonicamid (Mainman) UPL	29	Ingestion		P		Registered for control of Woolly Apple Aphid in apples, Green Peach Aphid and Melon Aphid in cucurbits, Green Peach Aphid, Melon Aphid and Potato Aphid in potatoes, and aphids in strawberries.	M Bee:VL	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of Green Peach Aphid in beans, green peas, eggplant, peppers, tomatoes, leafy vegetables, potatoes and sweet potatoes, Green Peach Aphid and Grey Cabbage Aphid in brassica vegetables, brassica leafy vegetables, Green Peach Aphid and Cotton Aphid in celery, rhubarb, cucurbits and herbs, Brown Sowthistle Aphid, Currant Lettuce Aphid and Green Peach Aphid in lettuce, chicory, endive and radicchio, Corn Aphid in sweet corn, suppression of Woolly Apple Aphid in pome fruit, and control of Black Cherry Aphid and Black Peach Aphid in stone fruit.	M Bee:L	-
Almond Moth (<i>Ephestia cautella</i>)								
Priority: Low								
Rated as a moderate priority in WA, and as a low priority in NSW, SA & VIC. Almond Moth is a relatively common pest of stored almonds. Fumigation can be used to treat infested storages.								
Chlorantraniliprole (Altacor)	28	Ingestion	14 NG	P-A	ALL	Registered in almonds for control of Carob Moth (<i>Ectomyelois ceratoniae</i>).	L Bee:VL	-
Methoxyfenozide (Prodigy)	18	Ingestion / IGR	7 NG	P-A	ALL	Registered in almonds for control of Carob Moth.	VL Bee:VL	-
Spinetoram (Delegate) Corteva	5	Ingestion	7 NG	P-A	ALL	Registered in almonds for control of Carob Moth.	M Bee:VH	-
Tetraniliprole (Vayego 200SC) Bayer	28	Ingestion	10 NG	P-A	ALL	Registered in almond for control of Carpophilus Beetle (<i>Carpophilus near dimidiatus</i>) and Carob Moth (<i>Ectomyelois ceratoniae</i>).	L-M Bee:VH	-
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
<i>Bacillus thuringiensis</i> (DiPEL)	11C	Biological / Ingestion	NR	P		Registered for control of various lepidopteran pests in fruit, herb, ornamental, turf, vegetable and vine crops.	VL Bee:VL	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Emamectin (Proclaim) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potato), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, cucurbits, legume vegetables, fruiting vegetables and grapes.	M Bee:H	-
Indoxacarb (Avatar) FMC	22A	Ingestion		P		Registered for control of various lepidopteran pests in asparagus, brassica vegetables, leafy vegetables, fruiting vegetables, celery, cucurbits, sweet corn, blueberries, <i>Rubus</i> spp., pome fruit, stone fruit, strawberries, grapes and macadamia.	M Bee:H	R3
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	H Bee:VH	-
Tebufenozide (Mimic) Corteva	16A	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, kiwifruit, longan, lychee and macadamia.	L Bee:L	-
Slugs and Snails (Gastropoda)								
Priority: Low								
Rated as a moderate priority in VIC, and as a low priority in NSW, SA & WA. Slugs and snails provide nuisance value in nut plantations and can be present in large numbers in favourable seasons.								
Metaldehyde	-	Contact & Ingestion	7	A	ALL	Registered in horticultural crops for the control of Snails & Slugs . Spread pellets evenly on ground. Retreatment interval and maximum number of treatments not specified.	-	-
Iron EDTA Complex	-	Contact & Ingestion	NR	P	ALL	Registered for control of Snails & Slugs in pasture, ornamentals, canola, poppies, vegetable crops, strawberries, citrus and grapes.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Green Peach Aphid (<i>Myzus persicae</i>)								
Priority: Low								
Rated as a moderate priority in WA, and as a low priority in NSW, SA & VIC. Green Peach Aphid are a sporadic pest in almonds.								
Petroleum Oil	-	Contact	NR	A	ALL (excl. QLD)	Registered in almonds for control of Aphids (eggs) and Mites (eggs). Apply as a foliar spray to dormant trees. Retreatment interval and maximum number of treatments per season not specified.	L Bee:L	-
Pirimicarb (Aphidex)	1A	Contact	28	P-A	ALL	Registered in almonds for control of Green Peach Aphid (<i>Myzus persicae</i>). Apply as a foliar application when aphids are detected. Do not make consecutive applications. Maximum of 2 treatments per season.	VL Bee:VL	R3
Potassium Salts of Fatty Acid (Natrasoap)	-	Contact	NR	A	ALL	Registered in nut trees for control of Aphids , Thrips, Mealybug, Two-Spotted Mite, Spider Mite & Whitefly. Apply as a cover spray. Treatments per season not limited.	L Bee:L	-
Pymetrozine (Chess)	9B	Contact & Ingestion	28	P-A	ALL	Registered in almonds for control of Green Peach Aphid (<i>Myzus persicae</i>). Apply as a foliar application when pest thresholds are reached. Use a minimum retreatment interval of 7 days. Do not apply consecutive applications within or between seasons. Maximum of 2 treatments per season.	L Bee:VL	R3
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion	7	A	ALL	Registered in almonds for control of Aphids (including Black Peach Aphid & Green Peach Aphid). Apply as a foliar application when pest population reaches threshold. Use a retreatment interval of 14 days if required. Maximum of 2 treatments per season.	M Bee:VH	R3
Afidopyropen (Versys) BASF	9D	Ingestion		P		Registered for control of various aphid species in sweet corn, rhubarb, artichokes, brassica vegetables, celery, cucurbits, fruiting vegetables, strawberry, leafy vegetables, brassica leafy vegetables, parsley, potato, sweet potato, ginger and ornamentals.	L Bee:L	-
<i>Beauveria bassiana</i> (Velifer) BASF	UN	Biological		P		Registered for suppression of various aphids in protected vegetables and ornamentals.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Registered for suppression of Green Peach Aphid in fruiting vegetables and potatoes, control of Melon Aphid in cucurbits, and control of Green Peach Aphid , Melon Aphid and Strawberry Aphid in strawberries.	L-M Bee:VH	-
Dimpropridaz (Efficon) BASF	UN	Contact & Ingestion		P		Registered for control of various aphids in cucurbits, brassica vegetables, leafy vegetables, brassica leafy vegetables and cotton.	M Bee:L	-
Fonicamid (Mainman) UPL	29	Ingestion		P		Registered for control of Woolly Apple Aphid in apples, Green Peach Aphid and Melon Aphid in cucurbits, Green Peach Aphid , Melon Aphid and Potato Aphid in potatoes, and aphids in strawberries.	M Bee:VL	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips.	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of Green Peach Aphid in beans, green peas, eggplant, peppers, tomatoes, leafy vegetables, potatoes and sweet potatoes, Green Peach Aphid and Grey Cabbage Aphid in brassica vegetables, brassica leafy vegetables, Green Peach Aphid and Cotton Aphid in celery, rhubarb, cucurbits and herbs, Brown Sowthistle Aphid, Currant Lettuce Aphid and Green Peach Aphid in lettuce, chicory, endive and radicchio, Corn Aphid in sweet corn, suppression of Woolly Apple Aphid in pome fruit, and control of Black Cherry Aphid and Black Peach Aphid in stone fruit.	M Bee:L	-
Ants (Formicidae)								
Priority: Low								
Rated as a moderate priority in NSW, and as a low priority in SA, VIC & WA. Ants are a nuisance pest in orchards, causing inconvenience to workers and potentially contaminating harvest without causing damage to nuts.								
Pyriproxyfen (Distance Ant Bait) Sumitomo	7C	IGR / Bait	NR	A	ALL	Registered in nut trees as an Ant bait. 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
Broflanilide (Vedira) BASF	30	Contact & Ingestion		P		Registered for control of ants in non-crop situations.	-	-
Metaflumizone (Siesta Ant Bait) BASF	22B	Ingestion		P		Registered for control of ants in non-crop situations.	-	-
Light Brown Apple Moth (<i>Epiphyas postvittana</i>)								
Priority: Low								
Rated as a moderate priority in WA, and as a low priority in NSW, SA & VIC. Light Brown Apple Moth does not usually cause damage in almonds.								
Chlorantraniliprole (Altacor)	28	Ingestion	14 NG	P-A	ALL	Registered in almonds for control of Carob Moth (<i>Ectomyelois ceratoniae</i>).	L Bee:VL	-
Methoxyfenozide (Prodigy)	18	Ingestion / IGR	7 NG	P-A	ALL	Registered in almonds for control of Carob Moth.	VL Bee:VL	-
Spinetoram (Delegate) Corteva	5	Ingestion	7 NG	P-A	ALL	Registered in almonds for control of Carob Moth.	M Bee:VH	-
Tetraniliprole (Vayego 200SC) Bayer	28	Ingestion	10 NG	P-A	ALL	Registered in almond for control of Carpophilus Beetle (<i>Carpophilus near dimidiatus</i>) and Carob Moth (<i>Ectomyelois ceratoniae</i>).	L-M Bee:VH	-
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
<i>Bacillus thuringiensis</i> (DiPEL)	11C	Biological / Ingestion	NR	P		Registered for control of various lepidopteran pests in fruit, herb, ornamental, turf, vegetable and vine crops.	VL Bee:VL	-
Emamectin (Proclaim) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potato), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, cucurbits, legume vegetables, fruiting vegetables and grapes.	M Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Indoxacarb (Avatar) FMC	22A	Ingestion		P		Registered for control of various lepidopteran pests in asparagus, brassica vegetables, leafy vegetables, fruiting vegetables, celery, cucurbits, sweet corn, blueberries, <i>Rubus</i> spp., pome fruit, stone fruit, strawberries, grapes and macadamia.	M Bee:H	R3
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	H Bee:VH	-
Tebufenozide (Mimic) Corteva	16A	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, kiwifruit, longan, lychee and macadamia.	L Bee:L	-
Indian Meal Moth (<i>Plodia interpunctella</i>)								
Priority: Low								
Rated as a low priority in NSW, SA, VIC & WA. Indian Meal Moth is a relatively common pest of stored almonds. Fumigation can be used to treat infested storages.								
Chlorantraniliprole (Altacor)	28	Ingestion	14 NG	P-A	ALL	Registered in almonds for control of Carob Moth (<i>Ectomyelois ceratoniae</i>).	L Bee:VL	-
Methoxyfenozide (Prodigy)	18	Ingestion / IGR	7 NG	P-A	ALL	Registered in almonds for control of Carob Moth.	VL Bee:VL	-
Spinetoram (Delegate) Corteva	5	Ingestion	7 NG	P-A	ALL	Registered in almonds for control of Carob Moth.	M Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Tetraniliprole (Vayego 200SC) Bayer	28	Ingestion	10 NG	P-A	ALL	Registered in almond for control of Carpophilus Beetle (<i>Carpophilus near dimidiatus</i>) and Carob Moth (<i>Ectomyelois ceratoniae</i>).	L-M Bee:VH	-
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
<i>Bacillus thuringiensis</i> (DiPEL)	11C	Biological / Ingestion	NR	P		Registered for control of various lepidopteran pests in fruit, herb, ornamental, turf, vegetable and vine crops.	VL Bee:VL	-
Emamectin (Proclaim) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potato), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, cucurbits, legume vegetables, fruiting vegetables and grapes.	M Bee:H	-
Indoxacarb (Avatar) FMC	22A	Ingestion		P		Registered for control of various lepidopteran pests in asparagus, brassica vegetables, leafy vegetables, fruiting vegetables, celery, cucurbits, sweet corn, blueberries, <i>Rubus</i> spp., pome fruit, stone fruit, strawberries, grapes and macadamia.	M Bee:H	R3
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	H Bee:VH	-
Tebufenozide (Mimic) Corteva	16A	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, kiwifruit, longan, lychee and macadamia.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Apple Weevil (<i>Otiorhynchus cribricollis</i>) Priority: Low Rated as a low priority in NSW, SA, VIC & WA. Apple Weevil is not a regular pest of almonds.								
Tetraniliprole (Vayego 200SC) Bayer	28	Ingestion	10 NG	P-A	ALL	Registered in almond for control of Carpophilus Beetle (<i>Carpophilus near dimidiatus</i>) and Carob Moth (<i>Ectomyelois ceratoniae</i>). Registered for control of weevils in macadamias, pome fruit and stone fruit.	L-M Bee:VH	-
Clothianidin (Samurai) Sumitomo	4A	Contact & Ingestion	14 NG	P-A	ALL	Registered in almond for control of Carob Moth and Carpophilus Beetle. Registered for control of Weevil Borer in bananas.	M Bee:VH	R2
Indoxacarb (Avatar) FMC	22A	Ingestion		P		Registered for control of various weevil pests in asparagus, celery, pome fruit, stone fruit, strawberries, grapes and macadamias.	L Bee:H	R3

4.3 Weeds of Almonds

4.3.1 Weed priorities

Weeds	Priority
Flaxleaf Fleabane (<i>Conyza bonariensis</i>)	H
Annual Ryegrass (<i>Lolium rigidum</i>)	H
Marshmallow (<i>Malva parviflora</i>)	M
Feathertop Rhodes Grass (<i>Chloris virgata</i>)	M
Prickly Paddy Melon (<i>Cucumis myriocarpus</i>)	M
Caltrop (<i>Tribulus terrestris</i>)	M
Wireweed (<i>Polygonum aviculare</i>)	M
Blackberry Nightshade (<i>Solanum nigrum</i>)	L
Silverleaf Nightshade (<i>Solanum elaeagnifolium</i>)	L
Wild Turnip (<i>Brassica tournefortii</i>)	L
Turnip Weed (<i>Rapistrum rugosum</i>)	L
Wild Radish (<i>Raphanus raphanistrum</i>)	L
Barnyard Grass (<i>Echinochloa colona</i>)	L
Fat-Hen (<i>Chenopodium album</i>)	L
Sowthistle (<i>Sonchus oleraceus</i>)	L
Nutgrass (<i>Cyperus rotundus</i>)	L
Couch Grass (<i>Cynodon dactylon</i>)	L
Common Heliotrope (<i>Heliotropium europaeum</i>)	L
Saffron Thistle (<i>Carthamus lanatus</i>)	L
Windmill Grass (<i>Chloris truncata</i>)	L
Pigweed (<i>Portulaca</i> spp.)	L
Shepherd's Purse (<i>Capsella bursapastoris</i>)	L
Chickweed (<i>Stellaria media</i>)	L
Johnson Grass (<i>Sorghum halepense</i>)	L
Spiny Emex (<i>Emex australis</i>)	L

Weed priorities can vary substantially between regions, and weed management generally is guided more by cultural methods than by specific problem weed species. An integrated weed management program incorporating mulch and inter-row grass cover should be used to reduce the need for herbicides in plantations. Our industry consultation identified Flaxleaf Fleabane and Annual Ryegrass as high priorities. These are both invasive species which are difficult to kill and must be managed using a sustained management program incorporating multiple control measures.

The risk of herbicide resistance should also be considered in devising a weed management program. In the case of Sowthistle, there has been confirmed cases of herbicide resistance to Groups 2, 4 and 9, and Blackberry Nightshade has confirmed resistance to Group 22⁸.

Specific resistance management strategies for high resistance risk (1 and 2) and moderate resistance risk (3, 4, 6, 9, 10, 12, 13, 14, 15, 18, 19, 22, 23, 27, 29, 30 and 31) herbicide modes of action are available on the CropLife Australia webpage.

⁸ <https://www.croplife.org.au/resources/programs/resistance-management/>

4.3.2 Available and potential products for weed control

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

Availability			
A	Available via either registration or permit approval		
P	Potential – a possible candidate to pursue for registration or permit		
P-A	Potential, already approved in the crop for another use		
Resistance risk		Regulatory risk (refer to Appendix 7)	
		R1	Short-term: Critical concern over retaining access
**	Moderate resistance risk	R2	Medium-term: Maintaining access of significant concern
***	High resistance risk	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Flaxleaf Fleabane (<i>Conyza bonariensis</i>)							
Priority: High							
Rated as a high priority in NSW, SA, VIC & WA. Flaxleaf Fleabane is a widespread weed that is difficult to control with herbicides. It seeds prolifically and can germinate year-round. Weed control should be targeted at small, actively growing weeds and usually multiple applications will be required. A combination of residual and knockdown herbicides should form part of an integrated approach to managing Flaxleaf Fleabane.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Flaxleaf Fleabane . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Flaxleaf Fleabane . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Flaxleaf Fleabane . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts 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
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Flaxleaf Fleabane . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Flaxleaf Fleabane . Apply as a directed or shielded spray.	NR NG	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Amitrole	34**		Registered for control of Fleabane in fallow and pine plantations.		P		-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Annual Ryegrass (<i>Lolium rigidum</i>) Priority: High							
Rated as a high priority in NSW & WA, and as a moderate priority in SA & VIC. The most serious grass weed of southern Australia with distribution that is gradually extending north. Populations are prone to herbicide resistance so integrated weed management and rotation of herbicide modes of action are important aspects of a long-term control strategy.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Annual Ryegrass . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Annual Ryegrass . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Annual Ryegrass . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Haloxyfop (Verdiict)	1***	Nut Trees / Directed Spray or Spot Spray	Registered in nut trees for control of grass weeds, including Annual Ryegrass . Apply as a directed spray or spot spray. Treatments per season not limited.	NR	A	ALL	-
Napropamide (Devrinol)	0**	Almonds / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Annual Ryegrass . Apply to bare soil prior to weed emergence. Do not apply when nuts are on the ground. Maximum of 1 treatment per season.	NR NG	A	VIC, TAS & SA	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Annual Ryegrass . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Annual Ryegrass . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds, including Annual Ryegrass . Apply to soil surface that is free of weeds, surface litter and clods, and ensure incorporation by a minimum of 5mm of rainfall or spray irrigation within 10 days.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Annual Ryegrass . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Annual Ryegrass . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
Trifluralin	3**	Orchards / Pre- emergence residual	Registered in orchards for control of Johnson Grass and Liverseed Grass (Urochloa). Registered for control of Annual Ryegrass in wheat, barley, triticale and vegetable crops.	NR	P-A	ALL (excl. NSW)	-
Amitrole	34**		Registered for control of Annual Ryegrass in fallow and potatoes.		P		-
Fluazifop-P (Fusilade)	1***		Registered for control Annual Ryegrass in blackcurrants, hops, broad beans, broccoli, brussel sprouts, cabbage, capsicums, carrots, cauliflower, celery, green beans, lettuce, tomatoes, apples, pears, grapes, stone fruit, citrus, onions, potatoes, cucurbits, strawberries, ornamentals and oilseed poppies.		P		-
Nonanoic Acid (Beloukha)	-		Registered for control of Annual Ryegrass in non-crop areas, turf, orchards & vineyards, fallow and forestry.		P		-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including Annual Ryegrass , in Brassica vegetables.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Marshmallow (<i>Malva parviflora</i>)							
Priority: Moderate							
Rated as a high priority in NSW, and as a moderate priority in SA, VIC & WA. Marshmallow is adapted to a wide variety of environments and highly competitive weed. Control with knockdown herbicides can be unreliable.							
Carfentrazone	14**	Tree Nuts/ Directed spray	Registered in tree nuts for control of broadleaf weeds, including Marshmallow . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR G:14	A	ALL	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Marshmallow . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Carfentrazone-Ethyl + Glyphosate (Broadway)	14** + 9**	Tree Nuts / Directed or Shielded Spray	Registered in tree nuts for control of broadleaf weeds, including Marshmallow . Apply as a directed spray or spot spray.	NR G:14	A	ALL	R3
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Marshmallow . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Marshmallow . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Marshmallow . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Marshmallow . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Fluroxypyr (Starane) Corteva	4**		Registered for control of Small Flowered Mallow in fallows.		P		-
Feathertop Rhodes Grass (<i>Chloris virgata</i>)							
Priority: Low							
Rated as a high priority in NSW, as a moderate priority in SA & VIC, and as a low priority in WA. Feathertop Rhodes Grass is an aggressive grass weed that is difficult to control with herbicides. Multiple herbicide applications are required.							
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Feather Top Rhodes Grass . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Clethodim (Select)	1***		Registered for control of Feathertop Rhodes Grass in beetroot, cabbage, celery, lettuce, potatoes, onions, forestry, non-bearing fruit trees and ornamentals.		P		-
Dichlobenil (Casoran)	29**		Registered for control of Annual Grass & Broadleaf Weeds in orchards, blackcurrants, raspberries and gooseberries.		P		-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Prickly Paddy Melon (<i>Cucumis myriocarpus</i>)							
Priority: Moderate							
Rated as a low priority in NSW, as a moderate priority in SA & VIC, and as a high priority in WA. Prickly Paddy Melon is a summer-growing annual broadleaf weed which has an invasive, sprawling growth habit. It is difficult to control with herbicides and requires a sustained management program over time to keep in check.							
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Prickly Paddy Melon . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Triclopyr (Garlon)	4**		Registered for control of Prickly Paddy Melon in fallows and sorghum.		P		-
Caltrop (<i>Tribulus terrestris</i>)							
Priority: Low							
Rated as a moderate priority in NSW, SA & VIC, and as a low priority in WA. Caltrop is an annual, summer-growing broadleaf that grows as a vine and has sharp spines on the fruiting structures. Established plants develop a strong taproot making herbicide control difficult.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Caltrop . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Caltrop . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Caltrop . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Caltrop . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Caltrop . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Caltrop . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds, including Caltrop . Apply to soil surface that is free of weeds, surface litter and clods, and ensure incorporation by a minimum of 5mm of rainfall or spray irrigation within 10 days.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Caltrop . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Trifluralin	3**	Orchards / Pre- emergence residual	Registered in orchards for control of Johnson Grass and Liverseed Grass (Urochloa). Registered for control of Caltrop in vegetable crops, grain legumes, cotton, lucerne, linseed, peanuts, peas, canola, safflower, sugarcane and sunflowers.	NR	P-A	ALL (excl. NSW)	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Wireweed (<i>Polygonum aviculare</i>)							
Priority: Moderate							
Rated as a moderate priority in NSW, SA & VIC, and as a low priority in WA. Wireweed grows rapidly in the warmer months and is difficult to control with herbicides. Application timing is critical to ensure small weeds are targeted.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Wireweed . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Wireweed . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Wireweed . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Wireweed . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Wireweed . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Wireweed . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Wireweed . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Wireweed . Apply as a directed or shielded spray.	NR NG	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Wireweed . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
Trifluralin	3**	Orchards / Pre-emergence residual	Registered in orchards for control of Johnson Grass and Liverseed Grass (<i>Urochloa</i>). Registered for control of Wireweed in peanuts, peas, canola, safflower, sugarcane, sunflowers, lupins, wheat, barley, triticale, vegetable crops, grain legumes, vetch, cotton, lucerne and linseed.	NR	P-A	ALL (excl. NSW)	-
Fluroxypyr (Starane) Corteva	4**		Registered for control of Wireweed in non-crop areas and pastures.		P		-
<p>Blackberry Nightshade (<i>Solanum nigrum</i>) Silverleaf Nightshade (<i>Solanum elaeagnifolium</i>) Priority: Low</p> <p>Blackberry Nightshade is rated as a moderate priority in NSW, a low priority in SA & VIC, and as a high priority in WA. Silverleaf Nightshade is rated as a high priority in NSW & WA, as a low priority in SA, and as a moderate priority in VIC. Blackberry Nightshade and Silverleaf Nightshade are competitive weeds that are widespread in all regions. Herbicide control is effective but requires timely application and avoidance of seed set over several years to bring the soil seed bank down.</p>							
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Blackberry Nightshade . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Blackberry Nightshade . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Blackberry Nightshade . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Blackberry Nightshade and Silverleaf Nightshade . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Blackberry Nightshade . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Blackberry Nightshade . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds. Registered for suppression of Blackberry Nightshade in carrots, processing peas, French beans, cabbage, cauliflower, broccoli and lettuce.	NR	A	ALL	-
Aclonifen (Emerger) Bayer	32**	Pre-Emergence	Bayer is expected to seek registration for pre-emergent control of grass and broadleaf weeds in various vegetable crops. Registered in Europe for use in potatoes, legume vegetables and cereals. Blackberry Nightshade is listed as moderately susceptible at a high rate.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Clomazone	13**		Registered for control of broadleaf weeds including Blackberry Nightshade in beans, poppies, potato and tobacco transplants.		P		-
Dimethenamid-P (Outlook) BASF	15**		Registered for control of grass and broadleaf weeds, including Blackberry Nightshade in sweet corn, beans, peas, pumpkins and kabocho.		P		-
Fluroxypyr (Starane) Corteva	4**		Registered for control of Blackberry Nightshade in non-crop areas and pastures.		P		-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Wild Turnip (<i>Brassica tournefortii</i>)							
Priority: Low							
Rated as a low priority in NSW, as a moderate priority in SA & VIC, and as a high priority in WA. Wild Turnip is a winter-growing, broadleaf weed that competes aggressively and runs to seed quickly. Targeting early growth stages is critical.							
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Wild Turnip . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Wild Turnip . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Wild Turnip . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Wild Turnip . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
Fluroxypyr (Starane) Corteva	4**		Registered for control of Wild Turnip in winter cereals.		P		-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Turnip Weed (<i>Rapistrum rugosum</i>)							
Priority: Low							
Rated as a moderate priority in NSW, as a low priority in SA & VIC, and as a high priority in WA. Turnip Weed is a winter-growing, broadleaf weed that competes aggressively and runs to seed quickly. Targeting early growth stages is critical.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Turnip Weed . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Turnip Weed . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Turnip Weed . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
Fluroxypyr (Starane) Corteva	4**		Registered for control of Turnip Weed in winter cereals.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Wild Radish (<i>Raphanus raphanistrum</i>)							
Priority: Low							
Rated as a low priority in NSW & SA, as a moderate priority in VIC, and as a high priority in WA. Wild Radish populations are prone to herbicide resistance so integrated weed management and rotation of herbicide modes of action are important aspects of a long-term control strategy.							
Carfentrazone	14**	Tree Nuts/ Directed spray	Registered in tree nuts for control of broadleaf weeds, including Wild Radish . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR G:14	A	ALL	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Wild Radish . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Carfentrazone-Ethyl + Glyphosate (Broadway)	14** + 9**	Tree Nuts / Directed or Shielded Spray	Registered in tree nuts for control of broadleaf weeds, including Wild Radish . Apply as a directed spray or spot spray.	NR G:14	A	ALL	R3
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Wild Radish . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Wild Radish . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Wild Radish . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Wild Radish . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Wild Radish . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Wild Radish . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Fluroxypyr (Starane)	4**		Registered for control of broadleaf weeds, including Wild Radish in winter cereals.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Barnyard Grass (<i>Echinochloa colona</i>)							
Priority: Low							
Rated as a high priority in NSW, as a low priority in SA & VIC, and as a moderate priority in WA. Barnyard Grass is a summer annual grass weed that is a prolific seeder, is highly competitive and is difficult to control with herbicides. It is prone to development of herbicide resistance, with confirmed cases of resistance to Group 9 and Group 5 herbicides.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Barnyard Grass . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Barnyard Grass . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Barnyard Grass . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts 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)	1***	Nut Trees / Directed Spray or Spot Spray	Registered in nut trees for control of grass weeds, including Barnyard Grass . Apply as a directed spray or spot spray. Treatments per season not limited.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Napropamide (Devrinol)	0**	Almonds / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Barnyard Grass . Apply to bare soil prior to weed emergence. Do not apply when nuts are on the ground. Maximum of 1 treatment per season.	NR NG	A	VIC, TAS & SA	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Barnyard Grass . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Barnyard Grass . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds, including Barnyard Grass . Apply to soil surface that is free of weeds, surface litter and clods, and ensure incorporation by a minimum of 5mm of rainfall or spray irrigation within 10 days.	NR	A	ALL	-
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Barnyard Grass . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Trifluralin	3**	Orchards / Pre-emergence residual	Registered in orchards for control of Johnson Grass and Liverseed Grass (Urochloa). Registered for control of Barnyard Grass in peanuts, peas, canola, safflower, sugarcane, sunflowers, lupins, vegetables crops, grain legumes, cotton, lucerne and linseed.	NR	P-A	ALL (excl. NSW)	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Fat-Hen (<i>Chenopodium album</i>)							
Priority: Low							
Rated as a moderate priority in NSW, as a low priority in SA & VIC, and as a high priority in WA. Herbicide control can be difficult and targeting weeds at early growth stages is critical.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Fat Hen . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Fat Hen . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Fat Hen . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Fat Hen . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Fat Hen . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Fat Hen . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Fat Hen . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds, including Fat Hen . Apply to soil surface that is free of weeds, surface litter and clods, and ensure incorporation by a minimum of 5mm of rainfall or spray irrigation within 10 days.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Fat Hen . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Fat Hen . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
Aclonifen (Emerger) Bayer	32**	Pre-Emergence	Bayer is expected to seek registration for pre-emergent control of grass and broadleaf weeds in various vegetable crops. Registered in Europe for use in potatoes, legume vegetables and cereals. Fat-Hen is listed as susceptible.		P		-
Nonanoic Acid (Beloukha)	-		Registered for control of Fat Hen in non-crop areas, turf, orchards & vineyards, fallow and forestry.		P		-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including Fat Hen in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Sowthistle (<i>Sonchus oleraceus</i>)							
Priority: Low							
Rated as a low priority in NSW & SA, and as a high priority in VIC & WA. Sowthistle is an annual broadleaf weed, that can germinate year-round, is prolific and widespread in all regions and it is also prone to development of herbicide resistance.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Sowthistle . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Sowthistle . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Sowthistle . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Sowthistle . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-
Napropamide (Devrinol)	0**	Almonds / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Sowthistle . Apply to bare soil prior to weed emergence. Do not apply when nuts are on the ground. Maximum of 1 treatment per season.	NR NG	A	VIC, TAS & SA	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Sowthistle . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Sowthistle . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Sowthistle . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds, including Sowthistle . Apply to soil surface that is free of weeds, surface litter and clods, and ensure incorporation by a minimum of 5mm of rainfall or spray irrigation within 10 days.	NR	A	ALL	-
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Sowthistle . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Sowthistle . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
Nonanoic Acid (Beloukha)	-		Registered for control of Sowthistle in non-crop areas, turf, orchards & vineyards, fallow and forestry.		P		-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including Sowthistle , in Brassica vegetables, green beans, navy beans and sugar cane.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Nutgrass (<i>Cyperus rotundus</i>)							
Priority: Low							
Rated as a low priority in NSW, SA & VIC, and as a high priority in WA. Nutgrass prefers damp, water-logged soils but the nuts can survive for years underground during dry times. Herbicide options are limited and unreliable. Improve soil drainage if possible.							
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts 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
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds. Registered for control of Nutgrass in asparagus.	NR	P-A	ALL	-
Cyhalofop-Butyl + Florpyrauxifen-Benzyl (Agixa Rinskor) Corteva	1*** + 4**		Registered for control of Nutgrass in rice.		P		-
Dimethenamid-P (Outlook) BASF	15**		Registered for control of grass and broadleaf weeds in sweet corn, beans, peas, pumpkins and kabocha. Permitted in bulb onions for suppression of Nutgrass and other <i>Cyperus</i> species in bulb onions.		P		-
Halosulfuron-Methyl (Sempra)	2***		Registered for control of Nutgrass in turf and sugarcane.		P		-
Couch Grass (<i>Cynodon dactylon</i>)							
Priority: Low							
Rated as a low priority in NSW & VIC, as a moderate priority in SA, and as a high priority in WA. Couch Grass is a widespread, perennial weed that grows year-round in most areas. Herbicide control is effective provided it is targeted to young, actively growing weeds. Multiple applications are usually required.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Couch Grass . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Couch Grass . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts 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)	1***	Nut Trees / Directed Spray or Spot Spray	Registered in nut trees for control of grass weeds, including Couch Grass . Apply as a directed spray or spot spray. Treatments per season not limited.	NR	A	ALL	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Couch Grass . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Common Heliotrope (<i>Heliotropium europaeum</i>)							
Priority: Low							
Rated as a low priority in NSW, SA & VIC, as a moderate priority in WA. Common Heliotrope (also known as Potato Weed) is a summer-growing, annual broadleaf weed. It is rapid growing and can disperse rapidly. Early control of seedlings is critical for managing infestations.							
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Saffron Thistle (<i>Carthamus lanatus</i>)							
Priority: Low							
Rated as a low priority in NSW, SA & VIC, as a moderate priority in WA. Saffron Thistle is an annual broadleaf weed that seeds prolifically and can spread rapidly if not controlled.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Saffron Thistle . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Saffron Thistle . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Saffron Thistle . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Windmill Grass (<i>Chloris truncata</i>)							
Priority: Low							
Rated as a low priority in NSW, SA, VIC & WA. Windmill Grass is a short-lived warm season perennial which is widespread and can rapidly colonise disturbed areas. The key to effective management is a consistent program of early control to prevent seeding.							
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Pigweed (<i>Portulaca</i> spp.) Priority: Low							
Rated as a low priority in NSW, SA, VIC & WA. Pigweed is a summer growing broadleaf weed that competes aggressively and can be difficult to control with herbicides.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Pigweed . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Flumioxazin (Chateau) Sumitomo	14**	Tree Nuts / Directed Spray / Residual Weed Control	Registered in tree nuts for control of grass and broadleaf weeds, including Pigweed . Apply to bare soil using a directed spray at the base of the bushes. At least 15mm of irrigation or rainfall is required to activate the herbicide. Best application is during the period following final harvest up to bud break. Avoid direct or indirect spray contact to foliage, fruit and green bark. Do not apply to trees established in the orchard for less than 1 year.	H:98 G:28	A	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Pigweed . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non- Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Pigweed . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-
Napropamide (Devrinol)	0**	Almonds / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Pigweed . Apply to bare soil prior to weed emergence. Do not apply when nuts are on the ground. Maximum of 1 treatment per season.	NR NG	A	VIC, TAS & SA	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Pigweed . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oryzalin	3**	Nuts / Directed Spray	Registered in nuts for control of grass & broadleaf weeds, including Pigweed . Apply to bare soil using a directed spray at the base of the trees. Requires at least 15mm of irrigation or rain to activate.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Pigweed . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds, including Pigweed . Apply to soil surface that is free of weeds, surface litter and clods, and ensure incorporation by a minimum of 5mm of rainfall or spray irrigation within 10 days.	NR	A	ALL	-
Trifluralin	3**	Orchards / Pre-emergence residual	Registered in orchards for control of Johnson Grass and Liverseed Grass (Urochloa). Registered for control of Pigweed in grain legumes, cotton, lucerne, linseed, peanuts, peas, canola, safflower, sugarcane, sunflowers, lupins, tobacco and vegetable crops.	NR	P-A	ALL (excl. NSW)	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Shepherd's Purse (<i>Capsella bursapastoris</i>)							
Priority: Low							
Rated as a low priority in NSW, SA & VIC, as a moderate priority in WA. Shepherd's Purse is an erect, annual broadleaf which is adapted to a wide range of environments. Herbicide options are limited.							
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts 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
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Shepherd's Purse . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Shepherd's Purse . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Shepherd's Purse . Apply as a directed or shielded spray.	NR NG	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Shepherd's Purse . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Chickweed (<i>Stellaria media</i>)							
Priority: Low							
Rated as a low priority in NSW, SA & VIC, as a moderate priority in WA. Chickweed is a low growing, winter annual weed that can continue growing all through summer. Targeting weed control prior to their flowering is critical.							
Carfentrazone	14**	Tree Nuts/ Directed spray	Registered in tree nuts for control of broadleaf weeds, including Chickweed . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR G:14	A	ALL	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Chickweed . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Carfentrazone-Ethyl + Glyphosate (Broadway)	14** + 9**	Tree Nuts / Directed or Shielded Spray	Registered in tree nuts for control of broadleaf weeds, including Chickweed . Apply as a directed spray or spot spray.	NR G:14	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Non-Bearing / Residual Weed Control	Registered in non-bearing nut orchards for control of broadleaf weeds, including Chickweed . Apply to bare soil prior to weed emergence. Rainfall or irrigation is required within 21 days to activate the herbicide.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Chickweed . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Registered in tree nuts for control of grass and broadleaf weeds, including Chickweed . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR NG	A	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray / Residual Weed Control	Registered in nuts for control of grass and broadleaf weeds, including Chickweed . Apply to soil surface that is free of weeds, surface litter and clods, and ensure incorporation by a minimum of 5mm of rainfall or spray irrigation within 10 days.	NR	A	ALL	-
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Chickweed . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Chickweed . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds, including Chickweed in Brassica vegetables.		P		-
Johnson Grass (<i>Sorghum halepense</i>)							
Priority: Low							
Rated as a low priority in NSW, SA, VIC & WA. Johnson Grass is a large, summer growing perennial that is difficult to eradicate with herbicides.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Johnson Grass . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Johnson Grass . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts 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)	1***	Nut Trees / Directed Spray or Spot Spray	Registered in nut trees for control of grass weeds, including Johnson Grass . Apply as a directed spray or spot spray. Treatments per season not limited.	NR	A	ALL	-
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Johnson Grass . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-
Trifluralin	3**	Orchards / Pre- emergence residual	Registered in orchards for control of Johnson Grass and Liverseed Grass (<i>Urochloa</i>). Apply to new plantings during pre-plant cultivation or to established crops in spring after weeds and green manure crops have been ploughed in.	NR	A	ALL (excl. NSW)	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Spiny Emex (<i>Emex australis</i>)							
Priority: Low							
Rated as a low priority in NSW, SA, VIC & WA. Spiny Emex is a vigorous annual with a thick taproot and fruits with distinctive clusters of spines.							
Carfentrazone	14**	Tree Nuts/ Directed spray	Registered in tree nuts for control of broadleaf weeds, including Spiny Emex . If weeds are already present, use as a spike in a mixture with glyphosate or paraquat.	NR G:14	A	ALL	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Spiny Emex . Apply as a directed or shielded spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:56	A	ALL	R3
Carfentrazone-Ethyl + Glyphosate (Broadway)	14** + 9**	Tree Nuts / Directed or Shielded Spray	Registered in tree nuts for control of broadleaf weeds, including Spiny Emex . Apply as a directed spray or spot spray.	NR G:14	A	ALL	R3
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Registered in tree nuts for control of grass & broadleaf weeds, including Spiny Emex . Apply as a directed or shielded spray.	NR G:56	A	ALL	R3
Glyphosate	9**	Tree Nuts/ Directed Spray, Shielded Spray or Wick Wiper	Registered in tree nuts 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
Norflurazon (Zoliar)	12**	Almonds / Directed Spray / Residual Weed Control	Registered in almonds for control of grass and broadleaf weeds, including Spiny Emex . Apply as a directed spray to bare ground prior to emergence. Avoid contact with foliage or fruit. Do not apply to trees that have been established for less than 18 months.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat (Gramoxone)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass and broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:1	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Registered in orchards for control of annual grass & broadleaf weeds. Apply as a directed spray or spot spray. Do not allow spray to contact any part of the tree, including the trunk.	NR G:7	A	ALL	R3
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Registered in almond orchards for control of grass and broadleaf weeds, including Spiny Emex . Apply as a directed or shielded spray.	NR NG	A	ALL	-
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Registered in almonds for control of various grass and broadleaf weeds, including Spiny Emex . Apply to bare, moist soil immediately after cultivation and before weeds emerge. Maximum of 2 treatments per year.	NR	A	ALL	R3
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-

4.4 Plant Growth Regulators in Almonds

4.4.1 Plant Growth Regulator Priorities

PGR Issue	Priority
Promote nut loosening	H
Initiation of flowering	M
Promote nut ripening	M

Plant Growth Regulators (PGRs) play a limited role in managing almond orchards. Promotion of nut loosening was identified as a high priority PGR issue.

4.4.2 Available and Potential Plant Growth Regulators

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

Availability		Regulatory risk (refer to Appendix 7)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Promote nut loosening							
Priority: High							
Rated as a high priority in NSW & SA, and as a low priority in VIC & WA.							
Ethephon	PGR		Registered for promoting uniform nut fall in macadamias.		P		-
Initiation of flowering							
Priority: Moderate							
Rated as a low priority in NSW & VIC, as a moderate priority in SA, and as a high priority in WA.							
Cyanamide (Dormex) Nufarm	PGR	Almonds	Registered in almonds for regulation of bud break and uniformity of flowering. Apply as a foliar application at 35 days before expected bud break, to advance and concentrate blossoming.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Promote nut ripening Priority: Moderate							
Rated as a moderate priority in NSW & VIC, as a high priority in SA, and as a low priority in WA.							
Ethephon	PGR		Registered for promoting uniform nut fall in macadamias.		P		-

5. References

5.1 Information:

AgChem Access Priority Access Forum	https://www.agrifutures.com.au/national-rural-issues/agvet-chemicals/
Australian Pesticide and Veterinary Medicines Authority	www.apvma.gov.au
APVMA Chemical review	https://apvma.gov.au/chemicals-and-products/chemical-review/listing
APVMA MRLs	www.legislation.gov.au/F2023L01350/latest/text
APVMA Permit search	Agricultural And Veterinary Permits Search - portal.apvma.gov.au
APVMA Product search	Public Chemical Registration Information System Search - portal.apvma.gov.au
Codex MRL database	http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/
Cotton Pest Management Guide 2023-24	https://www.cottoninfo.com.au/publications/cotton-pest-management-guide
CropLife Australia	https://www.croplife.org.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 almond
- Appendix 2. Products available for control of insects and other pests in almond
- Appendix 3. Products available for weed control in almond
- Appendix 4. Plant Growth Regulators available in almond
- Appendix 5. Current permits for use in almond
- Appendix 6. Almond Maximum Residue Limits (MRLs)
- Appendix 7. Almond regulatory risk assessment

Appendix 1. Products available for disease control in almonds

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
Azoxystrobin (Amistar)	11	Almond	Anthracoese (<i>Colletotrichum acutatum</i>) Brown Rot / Blossom Blight (<i>Monilinia laxa</i>) Shot-Hole (<i>Wilsonomyces carpophilus</i>)	ALL	28	-
Azoxystrobin + Tebuconazole (Custodia) Adama	11+3	Almonds	Brown Rot / Blossom Blight (<i>Monilinia laxa</i>) Shot-Hole (<i>Wilsonomyces carpophilus</i>) Rust (<i>Tranzschelia discolor</i>) Suppression of: Hull Rot (<i>Rhizopus</i> & <i>Monilinia</i> spp.)	ALL	NR	R3
Bromo Chloro Dimethyl Hydatoin (BCDMH)	-	Sanitiser / Post-Harvest Treatment	External Rot Causing Organisms	ALL	NR	-
Captan	M4	Almonds	Anthracoese (<i>Colletotrichum acutatum</i>) Blossom Blight (<i>Monilinia laxa</i>) Shot-Hole (<i>Wilsonomyces carpophilus</i>) Nut Scab (<i>Cladosporium carpophilum</i>)	NSW, VIC & SA	28 NG	-
Chlorine	-	Sanitiser / Post-Harvest Treatment	Bacteria and Fungi	ALL	NR	-
Chloropicrin + 1,3-Dichloropropene	8B	Nut Crops / Soil Fumigant	Soil-borne diseases (including <i>Fusarium</i> & <i>Verticillium</i> Wilts, <i>Rhizoctonia</i> , <i>Pythium</i>)	ALL	NR	-
Chlorothalonil (Bravo)	M5	Almonds	Shot-Hole (<i>Stigmina carpophila</i>) Stone Fruit Rust (<i>Tranzschelia discolor</i>)	ALL (excl. QLD)	NR	R3
Copper (Cu)	M1	Almonds	Shot-Hole Leaf Curl (<i>Taphrina deformans</i>)	ALL	1	-
Cyprodinil (Solaris)	9	Almonds	Blossom Blight / Brown Rot (<i>Monilinia laxa</i>) Rust (<i>Tranzschelia discolor</i>) Shot-Hole (<i>Wilsonomyces carpophilus</i>)	ALL	NR	R3

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Almonds	Blossom Blight Stone Fruit Rust Shot-Hole Suppression of: Hull Rot	ALL	14 NG	R3
Fluopyram + Trifloxystrobin (Luna Sensation) Bayer	7+11	Almonds	Blossom Blight Stone Fruit Rust Shot Hole Suppression of: Hull Rot	ALL	14 NG	-
Iprodione (Rovral)	2	Almonds	Blossom Blight / Brown Rot (<i>Monilinia</i> spp.)	ALL	NR	R2
Isopyrazam (Seguris) Syngenta	7	Almonds	Scab (<i>Venturia carpophila</i>) Stone Fruit Rust (<i>Tranzschelia discolor</i>) Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) Shot Hole (<i>Wilsonomyces carpophilus</i>) Suppression of: Anthracnose (<i>Colletotrichum acutatum</i>) Hull Rot (<i>Rhizopus</i> spp.)	ALL	14 NG	-
Mancozeb	M3	Almonds	Brown Rot Rust Shot Hole Freckle	ALL	14	R2
Mefentrifluconazole (Belanty) BASF	3	Almond	Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) Suppression of: Leaf Rust (<i>Tranzschelia discolor</i>) Shot Hole (<i>Wilsonomyces carpophilus</i>) Hull Rot (<i>Rhizopus</i> spp.)	ALL	14 NG	-
Metalaxyl-M (Ridomil Gold) PER94212	4	Almond	Collar Rot, Crown Rot & Root Rot (<i>Phytophthora</i> spp.)	ALL	42 NG	-

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
Penthiopyrad (Fontelis) Corteva	7	Almonds	Brown Rot / Blossom Blight (<i>Monilinia</i> spp.)	ALL	14 NG	-
Peroxyacetic Acid	-	Sanitiser / Post-Harvest Treatment	Bacteria	ALL	NR	-
Phosphorous Acid	33	Almonds	Suppression of: <i>Phytophthora</i> spp.	ALL	28	-
Polyoxin D Zinc Salt (Intervene) Nufarm	19	Almonds	Suppression of: Hull Rot (<i>Rhizopus</i> spp., <i>Botrytis</i> spp.)	ALL	NR	-
Propiconazole PER12989	3	Almonds	Blossom Blight (<i>Monilinia laxa</i>) Anthracnose (<i>Colletotrichum acutatum</i>)	ALL (excl. VIC)	14	R3
Pyraclostrobin (Cabrio)	11	Almonds	Rust (<i>Tranzschelia discolor</i>)	ALL	NR	-
Pyraclostrobin + Fluxapyroxad (Merivon) BASF	11+7	Almond	Shot Hole (<i>Wilsonomyces carpophilus</i>) Blossom Blight / Brown Rot (<i>Monilinia</i> spp.) Leaf Rust (<i>Tranzschelia discolor</i>) Alternaria Leaf Spot (<i>Alternaria alternate</i>) Anthracnose (<i>Colletotrichum acutatum</i>) Scab or Freckle (<i>Cladosporium carpophila</i>)	ALL	21 NG	-
<i>Rhizobium rhizogenes</i> strain K1026/g (NoGall)	-	Almonds	Crown Gall	ALL	NR	-
Sulfur	M2	Almonds	Freckle Leaf Curl Rust Shot Hole Brown Rot / Blossom Blight	ALL ALL (excl. WA)	NR	-

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
Tebuconazole (Greenseal Pruning Wound Dressing)	3	Almonds	Eutypa Dieback	ALL	NR	R3

Appendix 2. Products available for control of insects and other pests in almonds

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
1,3-Dichloropropene	-	Nut Crops / Soil Fumigant	Plant parasitic nematodes	ALL	NR	-
1-Dodecanol, (E,E) 8,10 Dodecadien-1-OL, Dodecenol Acetate - 8 Z, Dodecenyl Acetate - 8 E, Tetradecan-1-OL (Isomate)	-	Almond / Mating Disruption	Oriental Fruit Moth (<i>Cydia molesta</i>) Codling Moth (<i>Cydia pomonella</i>)	SA, VIC, NSW, QLD & TAS	NR	-
Abamectin	6	Almond	Two Spotted Mite (<i>Tetranychus urticae</i>) Brown Almond Mite (<i>Bryobia rubrioculus</i>)	ALL	28	-
Bifenazate (Acramite)	20D	Almonds	Two Spotted Mite (<i>Tetranychus urticae</i>) Bryobia Mite (<i>Bryobia rubrioculus</i>)	ALL	14 G:28	-
Bifenthrin (Talstar) PER87216	3A	Almonds	Carpophilus Beetle / Dried Fruit Beetle (<i>Carpophilus</i> spp.)	ALL	7	R3
1. BeetleJuice A – containing a mixture of ethanol, ethyl acetate, 2-methyl-1-propanol, 2- methyl-1-butanol and 3-methyl- 1-butanol 2. BeetleJuice B – containing a mixture of ethanol and acetaldehyde 3. BeetleJuice Pheromone Lure (BeetleJuice Carpophilus Trapping System) PER14866	-	Almonds / Pest Trapping and Monitoring	Carpophilus Beetle (<i>C. davidsoni</i> <i>C. hemipterus</i> <i>C.</i> <i>mutilates</i>)	ALL	NR	-
Chlorantraniliprole (Altacor)	28	Almonds	Carob Moth (<i>Ectomyelois ceratoniae</i>)	ALL	14 NG	-

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
Chloropicrin + 1,3-Dichloropropene	-	Nut Crops / Soil Fumigant	Plant Parasitic Nematodes Symphylans Wireworms	ALL	NR	-
Chlorpyrifos PER13642	1B	Tree Nuts	Australian Plague Locust (<i>Chortoicetes terminifera</i>)	ALL (excl. VIC)	30 G:2	R1
Clofentezine (Apollo)	10A	Almonds	Two Spotted Mite (<i>Tetranychus urticae</i>) Brown Almond Mite (<i>Bryobia rubrioculus</i>)	ALL	35 NG	-
Clothianidin (Samurai) Sumitomo	4A	Almond	Carob Moth Carpophilus Beetle	ALL	14 NG	R2
Cyflumetofen (Danisaraba) BASF	25A	Almonds	Two Spotted Mite (<i>Tetranychus urticae</i>) European Red Mite (<i>Panonychus ulmi</i>) Bryobia Mite (<i>Bryobia</i> spp.)	ALL	7 NG	-
Etoxazole (Paramite) Sumitomo	10B	Almonds	Two Spotted Mite (<i>Tetranychus urticae</i>) European Red Mite (<i>Panonychus ulmi</i>) Bryobia Mite (<i>Bryobia rubrioculus</i>)	ALL	14 NG	-
Etoxazole + Piperonyl Butoxide (Motto) Intrade	10B	Almonds	Two Spotted Mite (<i>Tetranychus urticae</i>) European Red Mite (<i>Panonychus ulmi</i>)	ALL	14	-
Malathion PER13642	1B	Tree Nuts	Australian Plague Locust (<i>Chortoicetes terminifera</i>)	ALL (excl. VIC)	NR G:2	R3
Metaldehyde	-	Horticultural Crops	Snails & Slugs	ALL	7	-
Methoxyfenozide (Prodigy)	18	Almonds	Carob Moth	ALL	7 NG	-
Petroleum Oil	-	Almonds	Aphids (eggs) Mites (eggs) San Jose Scale Mites Scale	ALL (excl. QLD) ALL (excl. QLD, TAS)	NR	-

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
Pirimicarb (Aphidex)	1A	Almonds	Green Peach Aphid (<i>Myzus persicae</i>)	ALL	28	R3
Potassium Salts of Fatty Acid (Natrasoap)	-	Nut Trees	Aphids Thrips Mealybug Two-Spotted Mite Spider Mite Whitefly	ALL	NR	-
Pymetrozine (Chess)	9B	Almonds	Green Peach Aphid (<i>Myzus persicae</i>)	ALL	28	R3
Pyriproxyfen (Distance Ant Bait) Sumitomo	7C	Nut Tree / Ant Bait	Invasive and Nuisance Ants	ALL	NR	-
Spinetoram (Delegate) Corteva	5	Almonds	Carob Moth	ALL	7 NG	-
Spinosad (Naturalure) Corteva	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	-
Sulfoxaflor (Transform) Corteva	4C	Tree Nuts	Aphids (including Black Peach Aphid & Green Peach Aphid)	ALL	7	R3
Sulfur	M2	Almonds	Bryobia Mite (<i>Bryobia rubrioculus</i>)	ALL	NR	-
Tetraniliprole (Vayego 200SC) Bayer	28	Almond	Carpophilus Beetle (<i>Carpophilus near dimidiatus</i>) Carob Moth (<i>Ectomyelois ceratoniae</i>)	ALL	10 NG	-

Appendix 3. Products available for weed control in almonds

Active ingredient (Trade Name)	Chemical Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory Risk
Carfentrazone	14**	Tree Nuts	Broadleaf Weeds	NR G:14	ALL	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Tree Nut Plantations / Directed or Shielded Spray	Grass & Broadleaf Weeds	NR G:56	ALL	R3
Carfentrazone-Ethyl + Glyphosate (Broadway)	14** + 9**	Tree Nuts / Directed or Shielded Spray	Broadleaf Weeds	NR G:14	ALL	R3
Flumioxazin (Chateau)	14**	Tree Nuts / Directed Spray / Residual Weed Control	Grass and broadleaf weeds	98 G:28	ALL	-
Glufosinate (Basta)	10**	Tree Nut Plantations / Directed or Shielded Spray	Grass and broadleaf weeds	NR G:56	ALL	R3
Glyphosate (Roundup)	9**	Tree Nuts / Directed Spray, Shielded Spray or Wick Wiper	Grass and broadleaf weeds	NR	ALL	R3
Haloxypop (Verdict)	1***	Nut Trees / Directed Spray or Spot Spray	Grass weeds	NR	ALL	-
Isoxaben (Gallery) Corteva	29**	Nut Orchards / Residual Weed Control	Broadleaf weeds	NR	ALL	-
Napropamide (Devrinol)	0**	Almonds	Grass and broadleaf weeds	NR NG	VIC, TAS & SA	-
Norflurazon (Zoliar)	12	Almonds / Directed Spray / Residual Weed Control	Grass and broadleaf weeds	NR	ALL	-

Active ingredient (Trade Name)	Chemical Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory Risk
Oryzalin	3**	Nuts / Directed Spray	Grass and broadleaf weeds	NR	ALL	-
Oxyfluorfen (Goal)	14**	Tree Nuts / Directed Spray	Grass and broadleaf weeds	NR NG	ALL	-
Paraquat (Gramoxone)	22**	Orchards / Directed Spray	Grass and broadleaf weeds	NR G:1	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Orchards / Directed Spray or Spot Spray	Grass and broadleaf weeds	NR G:7	ALL	R3
Pendimethalin (Stomp)	3**	Nuts / Directed Spray, Requires Incorporation	Grass and broadleaf weeds	NR	ALL	-
Saflufenacil (Sharpen) BASF	14**	Almond Orchards / Directed Spray	Grass and broadleaf weeds	NR NG	ALL	-
Simazine	5**	Almonds / Established for 3 Years / Directed Spray / Residual Weed Control	Grass and broadleaf weeds	NR	ALL	R3
Trifluralin	3**	Orchards / Residual Weed Control	Johnson Grass Liverseed Grass (Urochloa)	NR	ALL (excl. NSW)	-

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

Appendix 4. Plant Growth Regulators available in almonds

Active ingredient (Trade Name)	Chemical Group	Situation	Comment / Use	WHP (days)	States	Regulatory risk
Aminoethoxyvinylglycine (Retain)	PGR	Almonds	Extend flower life	NR G:14	ALL	-
Cyanamide (Dormex) Nufarm	PGR	Almonds	Regulation of bud break & uniformity of flowering	NR	ALL	-

Appendix 5. Current permits for use in almonds

Permit ID	Description	Date Issued	Expiry Date	Permit holder
PER94212	Metalaxyl-M (Ridomil Gold) / Almond / Collar Rot, Crown Root & Root Rot Emergency Use Permit	30-Nov-23	30-Nov-25	Hort Innovation
PER87216 Version 2	Bifenthrin (Talstar) / Almonds / Carpophilus Beetle & Dried Fruit Beetle	1-Apr-19	28-Feb-26	Hort Innovation
PER14866	Carpophilus Catcha Trapping System / Almonds / Carpophilus Beetles	29-Mar-15	29-Mar-25	ABA C/Hort Innovation
PER13642 Version 2	Chlorpyrifos & Maldison / Tree Nuts / Australian Plague Locust	1-Sep-12	30-Jun-25	ANIC C/Hort Innovation
PER12989 Version 4	Propiconazole / Almonds / Blossom Blight & Anthracnose	1-Sep-11	31-Aug-26	Hort Innovation

Appendix 6. Almond Maximum Residue Limits (MRLs)

CODEX commodity groupings of almonds and subgroups:

	Nuts and Seeds
TN 0085	Tree nuts
TN 0660	Almonds

Note: A large proportion of Australian almonds are exported with a mix of both in-shell and kernel being sent overseas. The major export destinations are China (36%), Spain (14%), Turkey (10%), Vietnam (10%) and India (7%). Available information indicates that in the absence of specific limits in legislation, that some 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
2,4-D	TN 0085	Tree Nuts	-	0.2
Abamectin	TN 0660	Almonds	*0.01	-
	TN 0085	Tree Nuts	-	*0.005
Acetamiprid	TN 0085	Tree Nuts {except pistachio nut}	-	0.06
Afidopyropen	TN 0085	Tree Nuts	-	*0.01
Aminoethoxyvinylglycine	TN 0660	Almonds	*0.05	-
Azoxystrobin	TN 0660	Almonds	*0.01	-
	TN 0085	Tree Nuts	-	0.01
Bifenazate	TN 0660	Almonds	0.1	-
	TN 0085	Tree Nuts	-	0.2
Bifenthrin	TN 0660	Almonds	T0.1	-
	TN 0085	Tree Nuts	-	0.05
Boscalid	TN 0085	Tree Nuts {except pistachio nut}	-	*0.05
Buprofezin	TN 0085	Tree Nuts	-	*0.05
Captan	TN 0660	Almonds	0.3	0.3
Carbaryl	TN 0085	Tree Nuts	-	1
Carbendazim	TN 0085	Tree Nuts	-	*0.1
Carfentrazone-ethyl	TN 0085	Tree Nuts	*0.05	-
Chlorantraniliprole	TN 0085	Tree Nuts	0.1	0.02
Chlordane	TN 0660	Almonds	-	E0.02
Chlorothalonil	TN 0660	Almonds	T0.1	-
Chlorpyrifos	TN 0085	Tree Nuts	T0.05	-
Clofentezine	TN 0660	Almonds	0.5	-
	TN 0085	Tree Nuts	-	0.5
Clothianidin (see also thiamethoxam)	TN 0660	Almonds	0.05	-
Cyanamide	TN 0660	Almonds	*0.01	-
Cyantraniliprole	TN 0085	Tree Nuts	-	0.04
Cyclaniliprole	TN 0085	Tree Nuts	*0.01	-
	TN 0660	Almonds	-	0.03

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Cyflumetofen	TN 0660	Almonds	0.01	-
	TN 0085	Tree Nuts	-	*0.01
Cyhalothrin	TN 0085	Tree Nuts	-	*0.01
Cypermethrins	TN 0085	Tree Nuts	-	*0.05
Cyprodinil	TN 0660	Almonds	*0.01	*0.01
Dithianon	TN 0660	Almonds	-	*0.05
Diazinon	TN 0085	Tree Nuts	0.1	-
Dicofol	TN 0660	Almonds	5	-
Difenoconazole	TN 0085	Tree Nuts	-	0.03
Diflubenzuron	TN 0085	Tree Nuts	-	0.2
Diquat	TN 0085	Tree Nuts	*0.05	-
Dithiocarbamates	TN 0660	Almonds	3	*0.1
Emamectin Benzoate	TN 0085	Tree Nuts	-	*0.001
Etoxazole	TN 0660	Almonds	*0.01	-
	TN 0085	Tree Nuts	-	*0.01
Fenazaquin	TN 0085	Tree Nuts	-	0.02
Fenbuconazole	TN 0085	Tree Nuts	-	*0.01
Fenbutatin oxide	TN 0660	Almonds	-	0.5
Fenhexamid	TN 0660	Almonds	-	*0.02
Fenpropathrin	TN 0085	Tree Nuts	-	0.15
Fenpyrazamine	TN 0660	Almonds	-	*0.01
Fenpyroximate	TN 0085	Tree Nuts	-	*0.05
Fonicamid	TN 0660	Almonds	-	*0.01
Fluazifop-p-butyl	TN 0660	Almonds	-	*0.01
Flubendiamide	TN 0085	Tree Nuts	-	0.1
Fludioxonil	TN 0085	Tree Nuts {except Canarium nut, Chilean hazelnut and pistachios}	-	0.3
Fluensulfone	TN 0085	Tree Nuts	-	*0.02
Fluindapyr	TN 0085	Tree Nuts	-	0.04
Flumioxazin	TN 0085	Tree Nuts	*0.02	*0.02
Fluopyram	TN 0660	Almonds	0.05	-
	TN 0085	Tree Nuts	-	0.04
Flutriafol	TN 0660	Almonds	-	0.8
Fluxapyroxad	TN 0085	Tree Nuts	0.07	0.04
Fosetyl Al	TN 0085	Tree Nuts	-	400
Glufosinate and Glufosinate-ammonium	TN 0085	Tree Nuts	0.1	0.1
Glyphosate	TN 0085	Tree Nuts	0.2	-
Haloxypop	TN 0085	Tree Nuts	*0.05	-
Hexythiazox	TN 0085	Tree Nuts	-	*0.05
Hydrogen Phosphide	TN 0085	Tree Nuts	-	Po0.01
Imidacloprid	TN 0085	Tree Nuts	-	0.01
Indaziflam	TN 0660	Almonds	*0.01	-
Indoxacarb	TN 0085	Tree Nuts	-	0.07
Iprodione	TN 0660	Almonds	*0.02	0.2

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Isometamid	TN 0660	Almonds	-	*0.01
Isopyrazam	TN 0660	Almonds	*0.01	-
Isoxaben	TN 0085	Tree Nuts	*0.01	-
Malathion / Maldison	TN 0085	Tree Nuts	8	-
Mefentrifluconazole	TN 0660	Almonds	*0.01	-
	TN 0085	Tree Nuts	-	0.06
Mesotrione	TN 0085	Tree Nuts	-	*0.01
Metalaxyl	TN 0660	Almonds	T5	-
Metconazole	TN 0085	Tree Nuts	-	*0.04
Methoxyfenozide	TN 0660	Almonds	0.2	-
	TN 0085	Tree Nuts	-	0.1
Methyl bromide	TN 0085	Tree Nuts	-	Po*0.01
Napropamide	TN 0660	Almonds	*0.1	-
Norflurazon	TN 0085	Tree Nuts	*0.2	-
Oryzalin	TN 0085	Tree Nuts	0.1	-
Oxyfluorfen	TN 0085	Tree Nuts	0.05	-
Paraquat	TN 0085	Tree Nuts	*0.05	0.05
Pendimethalin	TN 0085	Tree Nuts	*0.05	0.05
Penthiopyrad	TN 0085	Tree Nuts	0.1	0.05
Permethrin	TN 0660	Almonds	-	0.1
Phosmet	TN 0085	Tree Nuts	-	0.2
Phosphine	TN 0085	Tree Nuts	*0.01	-
Phosphorous Acid	TN 0085	Tree Nuts	3000	-
Piperonyl butoxide	TN 0085	Tree Nuts	8	-
Pirimicarb	TN 0660	Almonds	0.05	-
Propargite	TN 0660	Almonds	-	*0.01
Propiconazole	TN 0660	Almonds	0.2	-
Propylene Oxide	TN 0660	Almonds	100	-
Pydiflumetofen	TN 0085	Tree Nuts	-	0.05
Pymetrozine	TN 0660	Almonds	*0.01	-
Pyraclostrobin	TN 0085	Tree Nuts {except pistachio nut; walnut}	0.07	-
	TN 0085	Tree Nuts {except pistachio nuts}	-	*0.02
Pyrethrins	TN 0085	Tree Nuts	1	Po*0.5
Pyrimethanil	TN 0660	Almonds	-	0.2
Saflufenacil	TN 0085	Tree Nuts	*0.03	0.01
Simazine	TN 0085	Tree Nuts	*0.1	-
Spinetoram	TN 0085	Tree Nuts	-	0.01
Spinosad	TN 0085	Tree Nuts	T*0.01	0.07
Spirodiclofen	TN 0085	Tree Nuts	-	0.05
Spirotetramat	TN 0085	Tree Nuts	-	0.5
Sulfoxaflor	TN 0085	Tree Nuts {except macadamia nuts}	0.02	-
	TN 0085	Tree Nuts	-	0.03
Sulfuryl Flouride	TN 0085	Tree Nuts	7	Po3

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Tebuconazole	TN 0660	Almonds	0.05	-
	TN 0085	Tree Nuts	-	*0.05
Tebufenozide	TN 0660	Almonds	-	0.05
Tetraniliprole	TN 0660	Almonds	0.05	-
	TN 0085	Tree Nuts	-	0.03
Thiacloprid	TN 0085	Tree Nuts	-	0.02
Trifloxystrobin	TN 0660	Almonds	0.05	-
	TN 0085	Tree Nuts	-	*0.02

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

Note: Available information indicates that in the absence of specific limits in legislation, some 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.

* 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 2023. Compilation 3. Prepared 1 March 2024.

CODEX MRLs: CODEX Alimentarius International Food Standards database (January 2024), <http://www.fao.org/fao-who-codexalimentarius/codex-texts/dbs/pestres/en/>

Appendix 7. Almond regulatory risk assessment

Almond Agrichemical Regulatory Risk Assessment

March 2024

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

Almond Agrichemical Regulatory Risk Assessment

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

Active constituent	Chemical Group	Pest/Problem	Comment
INSECT AND OTHER PESTS			
Abamectin	6	Bryobia mite (Brown almond mite) Two-spotted mites	EU: Restricted use to permanent greenhouses
Bifenazate	20D	Bryobia mite (Brown almond mite) Two-spotted mites	Canada: Review initiated EU: Proposed restriction to non-edible crops and to permanent greenhouses.
Bifenthrin	3A	Carpophilus beetle/Dried fruit beetle (PER87216) Brown marmorated stink bug & Yellow stink bug (PER82374)	Canada: Not authorised EU/UK: No authorisation in place
Chlorantraniliprole	28	Carob moth	
Chlorpyrifos	1B	Plague locusts (PER13642)	APVMA: Proposed deletion of uses Codex: MRLs revoked Canada: Cancellation of all uses. EU/UK: No authorisation in place USA: EPA decision to cancel use on food crops
Clofentezine	10A	Two-spotted mites Bryobia mite (Brown almond mite)	EU: No authorisation
Clothianidin	4A	Carob moth Carpophilus beetle/Dried fruit beetle	APVMA: Under review Canada: Field uses cancelled or amended Codex: MRL proposed at *0.01 mg.kg EU/UK: No authorisation in place USA: Re-registration with new risk mitigation measures

Almond Agrichemical Regulatory Risk Assessment

Active constituent	Chemical Group	Pest/Problem	Comment
Cyflumetofen	25A	Bryobia mite	
		European red mite	
		Two-spotted mite	
Etoxazole	10B	Bryobia mite (Brown almond mite)	EU: Only uses on greenhouse ornamentals approved & Candidate for substitution
		European red mite	
		Two-spotted mites	
Fatty acids - K salt	U1	Aphids	
		Mealybug	
		Spider mites	
		Thrips	
		Two-spotted mites	
Indoxacarb	22A	Fire ants	Canada: Not authorised Codex: Tree nut MRL set at 0.07 mg/kg EU/UK: No Authorisation
Lambda-cyhalothrin	3A	Fruit flies(PER12961–SA Biosecurity) (Soil drench)	EU: Candidate for substitution
Malathion/Maldison	1B	Plague locusts (PER13642)	APVMA: Under review Codex: Re-evaluation scheduled for 2025 EU: Restricted use to permanent greenhouses
Methoxyfenozide	18	Carob moth	EU: Proposed restricted authorisation & Candidate for substitution
Paraffinic oil/petroleum oil	UN	Bryobia mite (Brown almond mite)	
		Aphids	
		Mites	
		San Jose scale	
		Scale insects	
Pirimicarb	1A	Green peach aphid	Codex: JMPR re-evaluation scheduled for 2025 EU: Candidate for substitution
Pymetrozine	9B	Green peach aphid	Canada: Restricted use to glasshouses only Codex: No registrant support EU/UK: No authorisations

Almond Agrichemical Regulatory Risk Assessment

Active constituent	Chemical Group	Pest/Problem	Comment
Pyriproxyfen	7C	Fire ants	
Spinetoram	5	Carob moth	Codex: Tree nut MRL set at 0.01 mg/kg EU: Authorisation expires June 2024
Sulfoxaflor	4C	Aphids	Codex: Tree nut MRL set at 0.03 mg/kg
		Black peach aphid	EU: Restricted to permanent glasshouses only
		Green peach aphid	USA: Pollinator concerns
Sulfur	UN	Bryobia mite (Brown almond mite)	
		San Jose scale	
		Frosted scale	
Tetraniliprole	28	Carob moth	Codex: Tree nut MRL set at 0.03 mg/kg
		Carpophilus beetle/Dried fruit beetle	EU: No authorisations

Almond Agrichemical Regulatory Risk Assessment

Active constituent	Chemical Group	Disease /Problem	Comment
DISEASES			
Azoxystrobin	11	Anthracnose	Canada: Review proposed
Azoxystrobin + tebuconazole	3 + 11	Blossom blight	Tebuconazole
		Brown rot	APVMA: nominated for review
		Rust	Canada: Under review
		Shot hole	EU: Candidate for substitution USA: Under review
Captan	M4	Anthracnose	Codex: Review scheduled 2025 EU: Under review proposed restriction to use in permanent greenhouses only USA: Under review
Chlorothalonil	M5	Rust	APVMA: nominated for review
		Shot hole	Canada: Cancellation of uses proposed EU/UK: No authorisation in place USA: Under review
Copper	M1	Brown rot	EU: Candidates for substitution
		Freckle and scab	
		Leaf curl	
		Shot hole	
Cyprodinil	9	Blossom blight	Canada: Under review
		Rust	EU: Candidate for substitution
		Shot hole	
Fluopyram + tebuconazole	7 + 3	Blossom blight	Tebuconazole
		Stone fruit rust	APVMA: nominated for review
		Shot hole	EU: Candidate for substitution
		Hull rot (Suppression)	

Almond Agrichemical Regulatory Risk Assessment

Active constituent	Chemical Group	Disease /Problem	Comment
Fluopyram + trifloxystrobin	7 + 11	Blossom blight	Trifloxystrobin Canada: Review initiated
		Hull rot	
		Rust	
		Shot hole	
Fluxapyroxad + pyraclostrobin	7 + 11	Rust	Pyraclostrobin Canada: Review initiated
		Alternaria leaf spot	
		Anthracnose	
		Blossom blight	
		Nut scab	
		Shot hole	
Iprodione	2	Blossom blight	Canada: Majority of food crop uses deleted Codex: MRL proposed at 0.3 mg/kg EU/UK: No authorisation in place USA: Proposed deletion or restriction of uses
		Brown rot	
Isopyrazam	7	Anthracnose	EU: No authorisation
		Blossom blight	
		Brown rot	
		Hull rot	
		Rust	
		Shot hole	
Mancozeb	M3	Blossom blight	APVMA: nominated for review Canada: Many uses cancelled Codex: To be reviewed EU/UK: No authorisation in place
		Brown rot	
		Freckle and scab	
		Rust	
		Shot hole	
Mefentrifluconazole	3	Blossom blight	Codex: MRL set at 0.06 mg/kg
		Hull rot	
		Shot hole	

Almond Agrichemical Regulatory Risk Assessment

Active constituent	Chemical Group	Disease /Problem	Comment
Metalaxyl-M	4	Collar rot, Crown rot & root rot (PER94212)	EU: Restricted use approval
Penthiopyrad	7	Blossom blight	
		Brown rot	
Phosphorous acid	33	Phytophthora (Suppression)	
Polyoxin D zinc salt	19	Hull rot (Suppression)	EU/UK: No authorisation in place
Propiconazole	3	Anthraco nose (PER12989)	APVMA: nominated for review
		Blossom blight (PER12989)	EU/UK: No authorisations USA: Under review
Pyraclostrobin	11	Rust	Canada: Review initiated
<i>Rhizobium rhizogenes</i>	NC	Crown gall	
Sulfur	M2	Blossom blight	
		Brown rot	
		Freckle and scab	
		Leaf curl	
		Rust	
		Shot hole	
Tebuconazole	3	Eutypa dieback (Wound dressing)	APVMA: nominated for review Canada: Under review EU: Candidate for substitution USA: Under review

Plant growth regulators		
Active constituent	Problem	Comment
Aminoethoxyvinylglycine (AVG)	Extend flower life	
Cyanamide	Regulation of bud dormancy	EU/UK: No authorisation

Almond Agrichemical Regulatory Risk Assessment

Active constituent	Chemical Group	Comment
WEEDS		
Carfentrazone-methyl	14	
Diquat	22	APVMA: Currently under review EU/UK: No authorisation in place
Flumioxazin	14	EU: Candidate for substitution
Glufosinate	10	Canada: Review proposed EU/UK: No authorisation in place
Glyphosate	9	Ongoing issues internationally EU: re-authorised
Haloxypop-P	1	EU/UK: No authorisation
Isoxaben	29	
Napropamide	0	
Norflurazon	12	EU/UK: No authorisation in place
Oryzalin	3	EU/UK: No authorisation in place
Oxyfluorfen	14	EU: Candidate for substitution USA: Interim review decision Label amendments proposed
Paraquat	22	APVMA: Currently under review Canada: Review initiated EU/UK: No authorisation in place Rotterdam Convention - nominated
Pendimethalin	3	EU: Candidate for substitution
Saflufenacil	14	EU/UK: No authorisation in place
Simazine	5	APVMA: nominated for review EU/UK: No authorisation in place

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Almond Agrichemical Regulatory Risk Assessment

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