Banana

Strategic Agrichemical Review Process (SARP)

May 2024

Hort Innovation
Project – MT23001

Hort Innovation Project Number:
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 banana 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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Table of Contents

1. Summary

The strategic levy investment project Strategic Agrichemical Review Process (SARP) - Updates (MT23001) is part of the Hort Innovation Banana 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 Banana 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
Fusarium Wilt / Panama Disease (*Fusarium oxysporum f. sp. cubense*)	H
Black Sigatoka (*Mycosphaerella fijiensis*)	H
Yellow Sigatoka (*Mycosphaerella musicola*)	H
Sooty Blotch (*Chaetothyrina musarum*)	H
Crown Rot (*Colletotrichum musae*, *Fusarium* spp, *Musicillium theobromae*)	H

1.2 Insects and other pests

The high priority insects and other pests are:

Insects and Other Pests	Priority
Banana Scab Moth (*Nacoleia octasema*)	H
Banana Weevil Borer (*Cosmopolites sordidus*)	H
Banana Spider Mite / Strawberry Mite (*Tetranychus lambi*)	H
Banana Flower Thrips (*Thrips hawaiiensis*)	H
Banana Rust Thrips (*Chaetanaphothrips signipennis*)	H

1.3 Weeds

There were no high priority weeds identified, but the following weeds were determined as moderate priority:

Weeds	Priority
Navua Sedge (*Cyperus* spp.)	M
Nutgrass (*Cyperus rotundus*)	M

1.4 Plant Growth Regulators

The high priority Plant Growth Regulator issues are:

PGR Issue	Priority
Crop timing	H
Sucker control	H
Plant destruction	H

2. The Australian Banana Industry

As a tropical fruit, banana production predominantly occurs in the North of Australia, in Queensland, Northern NSW, the Northern Territory and Western Australia. Production in Australia is dominated almost entirely by the Cavendish variety. It accounts for 97% of fresh production, with Lady Finger making up the remaining 3%.

Production for the year ending June 2023 was 374,251 tonnes. The value of production was worth $583.3 million while the wholesale value of fresh supply was $706.9 million.

Fresh Banana Seasonality by State[1]

State	22/23 Tonnes	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Queensland	351,796												
New South Wales	14,970												
Western Australia	6,549												
Northern Territory	936												
Availability Legend			High			Medium			Low			None	

Banana production is relatively stable as it is well established in the domestic fresh market and there in minimal trade of bananas on the international market. Seasonal factors can impact on production from year to year, but the relatively short cropping cycle usually means that production can recover in a reasonable time frame from impacts such as cyclones.

Australia has a limited amount of international trade in fresh bananas, with the little trade that does occur being dominated by dried banana products. For the year ending June 2023, 62 tonnes of dried bananas were imported, while 23 tonnes were exported.

[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 banana 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 banana industry regarding pesticide access, Hort Innovation has undertaken the current project to update the Strategic Agrichemical Review Process (SARP) for bananas.

The SARP process identifies diseases, insect pests and weeds of major concern to the banana 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 banana 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 bananas 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 Banana 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 link[2].

[2] https://www.planthealthaustralia.com.au/industries/

3.2 Minor use permits and registration

From a pesticide access perspective, the APVMA classifies bananas as a major crop. They fit within the APVMA Crop Group 006: Assorted tropical and sub-tropical fruits – inedible peel and Subgroup 006B: Assorted tropical and sub-tropical, inedible smooth peel – large. Therefore, access to minor use permits for a major crop can be relatively difficult and justification must be as provided in accordance with the APVMA's minor use guidance[3]. 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 banana industry is for manufacturers to register new pesticides uses in the crop.

3.3 Methods

The current version of the Banana Strategic Agrichemical Review Process (SARP) 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: 8 February 2024 A meeting with industry experts was conducted on 12 February 2024 to validate the survey results.
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 banana
Appendix 2. Products available for control of insects and other pests in banana
Appendix 3. Products available for weed control in banana
Appendix 4. Plant Growth Regulators available in banana
Appendix 5. Current permits for use in banana
Appendix 6. Banana Maximum Residue Limits (MRLs)
Appendix 7. Banana regulatory risk assessment

4. Diseases, pests and weeds of Bananas

Resistance management: To manage the risk of resistance development, integrated disease/pest/weed management (IDM/IPM/IWM) strategies should be adopted. The general principle is to integrate diverse chemical and non-chemical strategies; maximise efficacy; not rely on singular tools and rotate between different modes of action. It is always essential to follow all the label instructions. Specific resistance management strategies may apply. These can be found, along with other useful information, on the CropLife Australia website[4].

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 Bananas

4.1.1 Disease priorities

Disease	Priority
Fusarium Wilt / Panama Disease (*Fusarium oxysporum f. sp. cubense*)	H
Black Sigatoka (*Mycosphaerella fijiensis*)	H
Yellow Sigatoka (*Mycosphaerella musicola*)	H
Sooty Blotch (*Chaetothyrina musarum*)	H
Crown Rot (*Colletotrichum musae*, *Fusarium* spp, *Musicillium theobromae*)	H
Fruit Speckle (*Fusarium oxysporum*, *Fusarium semitectum*)	M
Bacterial Rot, Corm Rot, Soft Rot (*Pectobacterium* spp.)	M
Banana Leaf Rust (*Uredo musae*)	M
Banana Bunchy Top Virus (BBTV)	M
Banana Freckle (*Phyllosticta cavendishii*)	M
Leaf Speckle (*Mycosphaerella musae*)	M
Tropical Speckle (*Ramichloridium* spp.)	M
Mokillo (Bacterial Complex)	M
Fruit Spot (*Deightoniella torulosa*)	L
Anthracnose - post harvest (*Colletotrichum musae*)	L
Black Tip (*Deightoniella torulosa*)	L
Cigar End Tip Rot (*Verticillium* spp.)	L
Cordana Leaf Spot (*Cordana musae*)	L
Ripe Fruit Spot - post harvest (*Gloeosporium* spp.)	L
Squirter - post harvest (*Nigrospora musae*, *Nigrospora sphaerica*)	L

The following diseases have been identified as high priority in our industry consultation: Fusarium Wilt / Panama Disease, Black Sigatoka, Yellow Sigatoka, Sooty Blotch and Crown Rot.

Disease control is a major focus in banana plantations. 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 has a resistance management strategy[5] specifically related to the control of Yellow Sigatoka in bananas, and users must refer to it before using any product.

[5] https://www.croplife.org.au/resources/programs/resistance-management/banana-yellow-sigatoka/

4.1.2 Available and potential products for priority diseases

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

Availability		Regulatory risk (refer to Appendix 6)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required

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

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fusarium Wilt / Panama Disease (*Fusarium oxysporum f. sp. cubense*) **Priority: High**							
Rated as a high priority in QLD & NT, and as a moderate priority in NSW. Panama Disease is a serious disease that has been found on farms in Far North Queensland. It is a soil-borne fungus which is not eradicable and can survive in the soil for decades without host plants. The key to managing the disease is containment. Growers that suspect the presence of Panama Disease must report it to Biosecurity Queensland.							
Benzalkonium Chloride, Didecyl Dimethyl Ammonium Chloride (PER86485)	-	Sanitation	NR	A	ALL	Used for sanitation and decontamination of motor vehicles, tools, equipment and footwear that come into contact with plant material or soil infected with *Fusarium oxysporum f. sp. cubense* (Race 4), the fungus that causes **Panama Disease**.	-
Didecyl Dimethyl Ammonium Chloride (Steri-Max Biocide)	-	Sanitation & Water Treatment	NR	A	ALL	A broad spectrum sanitation and water treatment product for the control of the spread of **Panama Disease** in bananas. Used for sanitation and decontamination of machinery, vehicles, packing sheds and any other general disinfection, as well as in foot bath hygiene treatments.	-
Streptomyces lydicus (Actinovate) Novozymes Bioag	BM 02	Biological	NR	P-A	ALL	Registered as a biological soil amendment in all crops to supplement the activity of natural soil organisms. Registered for control of Fusarium Wilt in tomato as a foliar application.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P	ALL	Registered for control of *Botrytis* in grapes and strawberries. US registration for the control of ***Fusarium* spp.** and in artichoke, asparagus, brassica leafy vegetables, bulb vegetables, cucurbits, corn, fruiting vegetables, legume vegetables, oilseeds, soybean, strawberry and root & tuber vegetables.	-
Black Sigatoka (*Mycosphaerella fijiensis*) **Priority: High**							
Black Sigatoka is rated as a high priority in QLD, and as a low priority in NSW & NT. Black Sigatoka presents a serious threat to the Australian banana industry. Movement restrictions are in place from the far northern biosecurity zones to prevent it from spreading. It has not been detected on the Australian mainland. Any new detections must be reported to Biosecurity Qld. Yellow Sigatoka and Leaf Speckle cause similar symptoms in bananas and could mask an infection with Black Sigatoka.							
Difenoconazole (Score) Syngenta	3	Protectant & Curative	1	A	QLD, NSW & NT	Registered in bananas for the control of Yellow Sigatoka and **Black Sigatoka**. NSW, Sth Qld: Commence spraying at the start of the summer rainy season. Apply at least 2 consecutive applications at 21-28 day interval. Maximum of 5 Group 3 fungicides per season. NT, Nth Qld: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicides per season. DO NOT apply during Jul-Oct period.	R3
Propiconazole (Tilt)	3	Protectant & Curative	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot, Leaf Speckle, Cordana Leaf Spot and **Black Sigatoka**. Must be applied with a water miscible oil. NSW, Sth Qld: Commence spraying at the start of the summer rainy season. Apply at least 2 consecutive applications at 21-28 day interval. Maximum of 5 Group 3 fungicides per season. NT, Nth Qld: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicides per season. DO NOT apply during Jul-Oct period.	R3
Pyraclostrobin (Cabrio) BASF	11	Protectant & Curative	NR	A	ALL	Registered in bananas for the control of Leaf Speckle, Leaf Spot and **Black Sigatoka**. DO NOT use on bananas unless bunch covers are in place. Maximum of 4 applications per season, as part of a preventative disease control program. DO NOT apply consecutive sprays of pyraclostrobin or other Group 11 fungicides.	**-**

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Tebuconazole	3	Protectant & Curative	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot/Yellow Sigatoka, Leaf Speckle and **Black Sigatoka**. Tropical Areas: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14 day intervals. DO NOT use more than 6 applications per season. DO NOT apply during Jul-Sep period Sub-tropical Areas: Commence spraying at the onset of warm and humid/wet weather, normally Dec. Apply at least 2 consecutive applications at 21-28 day interval. DO NOT use more than 5 applications per season.	R3
Trifloxystrobin (Flint) Bayer	11	Protectant & Curative	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, **Black Sigatoka** and Cordana Leaf Spot. Should be used as part of a regular protectant program. Intervals between applications generally should be 14-21 days, but should be modified for locality, disease conditions and leaf emergence rates. DO NOT apply consecutive applications and apply a minimum of 2 sprays from a different activity group between any Group 11 fungicides. Tropical Areas: DO NOT use Group 11 fungicides from May-Sep. Maximum of 4 applications per season.	**-**
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	1	P-A	ALL	Registered in bananas for the control of Yellow Sigatoka**,** Leaf Speckle and Cordana Leaf Spot.	R3
Isotianil (Routine 200SC) Bayer	P03	Protectant	NR	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka and Common Leaf Speckle.	-
Florylpicoxamid (Verpixo Adavelt) Corteva	21	Protectant & Curative		P		Registered in cucurbits, fruiting vegetables, lettuce and strawberry for control of a range of diseases. Currently in development for registration in bananas, with activity on ***Mycosphaerella* spp.** and other leaf diseases.	**-**
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered in almonds, cherries and macadamias for control of various leaf diseases. US registration for control of Leaf Spot, Powdery Mildew, Anthracnose and Grey Mould in strawberries.	**-**

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	21	P		Registered in apples for control of Black Spot and in grapes for control of Powdery Mildew. US registration for control of **Mycosphaerella Blight** in legume vegetables.	R3
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered in berries and grapes for control of Botrytis, and in leafy vegetables and potato for control of Botrytis and Sclerotinia. US registration for control of ***Mycosphaerella* sp.** in brassicas.	R3
Yellow Sigatoka (*Mycosphaerella musicola*) **Priority: High**							
Yellow Sigatoka is rated as a high priority in QLD & NSW, and as a low priority in NT. Yellow Sigatoka is a serious and widespread disease in bananas, being endemic to all regions except WA. It is a prescribed pest meaning that growers are required to keep Yellow Sigatoka leaf levels below 5% by state government regulations. Yellow Sigatoka has the potential to mask an outbreak of the similar looking, but far more destructive exotic disease Black Sigatoka.							
Bacillus amyloliquefaciens Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	44	Protectant	NR	A	ALL	Registered for use in bananas for control of **Yellow Sigatoka** and suppression of Common Leaf Speckle. Intervals between fungicide applications should be 14-21 days, but should be modified for locality, disease conditions and leaf emergence rates. Maximum number of treatments not specified.	-
Chlorothalonil (Bravo)	M5	Protectant	1	A	QLD, NSW, NT & WA	Registered in bananas for the control of **Leaf Spot** and Leaf Speckle. Apply as a protectant with spray intervals: Nth Qld: Jan-Mar 14 days; After Mar 21 days and then 28-35 days during dry months Sth Qld: Dec-Apr 21 days WA: Nov-May 10-14 days; May-Nov 14-21 days NSW: Nov-May 21 days .	R3
Copper (Cu) as copper ammonium complex	M1	Protectant	1	A	ALL	Registered in bananas for the control of **Yellow Sigatoka** and Phytophthora Stem Canker. Spray monthly from Dec-May when weather conditions favour disease. Maximum number of treatments not specified.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Difenoconazole (Score) Syngenta	3	Protectant & Curative	1	A	QLD, NSW & NT	Registered in bananas for the control of **Yellow Sigatoka** and Black Sigatoka. NSW, Sth Qld: Commence spraying at the start of the summer rainy season. Apply at least 2 consecutive applications at 21-28 day interval. Maximum of 5 Group 3 fungicides per season. NT, Nth Qld: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicides per season. DO NOT apply during Jul-Oct period.	R3
Epoxiconazole (Opus 75) BASF	3	Protectant & Curative	1	A	ALL	Registered in bananas for the control of **Leaf Spot/Yellow Sigatoka** and Leaf Speckle. DO NOT use on bananas unless bunch covers are in place. Nth Qld, NT, WA: Apply as a protectant when conditions favour disease. Apply a maximum of 2 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicide per season, do not use during Jul-Sep period. Sth Qld, NSW: Commence spraying at the onset of wet/humid conditions. Maximum of 2 consecutive sprays at 21-28 day intervals. Do not use more than 5 Group 3 fungicides per season.	R3
Fluopyram (Luna Privilege) Bayer	7	Protectant & Curative	NR	A	QLD, NSW, WA & NT	Registered in bananas for the control of **Yellow Sigatoka,** Leaf Speckle and Cordana Leaf Spot. Apply as part of a regular protectant program using spray intervals of 14-21 days. Maximum of 4 applications per season.	**-**
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	1	A	ALL	Registered in bananas for the control of **Yellow Sigatoka,** Leaf Speckle and Cordana Leaf Spot. Apply as part of a regular protectant program using spray intervals of 14-21 days. Maximum of 4 applications per season.	R3
Fluxapyroxad (Sercadis) BASF	7	Protectant & Curative	NR	A	ALL	Registered in bananas for control of **Yellow Sigatoka** and Leaf Speckle. Apply as part of a preventative disease program at a retreatment interval of 14-21 days. Maximum of 4 applications per season.	**-**
Isotianil (Routine 200SC) Bayer	P03	Protectant	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of **Yellow Sigatoka** and Common Leaf Speckle. Apply as a foliar spray after the uniform 8 leaf stage is reached. Do not apply unless the banana bunches are bagged. Use a minimum retreatment interval of 8 weeks. Maximum of 4 applications per season.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mancozeb	M3	Protectant	NR	A	ALL	Registered in bananas for the control of **Leaf Spot** and suppression of Leaf Speckle, Fruit Speckle, Cordana Leaf Spot and Black Pit. Note that addition of spraying oil is required (1 day WHP). Apply when weather conditions favour disease outbreak. NSW / Ground Application: Dec/Jan-May 21 day intervals NSW / Aerial Application: Dec/Jan-May 7-10 day intervals Sth Qld: Dec/Jan-May 21 day intervals Nth Qld, NT: Wet season – 14 day intervals; After and in the lead up to wet season – 21 day intervals; drier months – 28-35 days Maximum number of treatments not specified.	R2
Metiram (Polyram)	M3	Protectant	NR	A	ALL	Registered in bagged bananas for the control of **Leaf Spot,** Black Pit, Cordana Leaf Spot, Fruit Speckle and Leaf Spot. Note spray oil has a 1 day WHP. Apply when weather conditions favour disease outbreak. NSW / Ground Application: Dec/Jan-May 21 day intervals Sth Qld: Dec/Jan-May 21 day intervals Nth Qld, NT: Wet season – 14 day intervals; After and in the lead up to wet season – 21 day intervals; drier months – 28-35 days.	R2
Petroleum Oil	-	Protectant	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Cercospora Leaf Spot, Leaf Speckle and Cordana Leaf Spot. Apply with mancozeb or propiconazole for control of **Leaf Spot**, Leaf Speckle, Fruit Speckle, Cordana Leaf Spot and Black Sigatoka. Retreatment interval and maximum number of treatments not specified.	-
Propiconazole (Tilt)	3	Protectant & Curative	1	A	QLD, NSW, WA & NT	Registered in bananas for control of **Leaf Spot**, Leaf Speckle, Cordana Leaf Spot and Black Sigatoka. Must be applied with a water miscible oil. NSW, Sth Qld: Commence spraying at the start of the summer rainy season. Apply at least 2 consecutive applications at 21-28 day interval. Maximum of 5 Group 3 fungicides per season. NT, Nth Qld: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicides per season. DO NOT apply during Jul-Oct period.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Pyraclostrobin (Cabrio) BASF	11	Protectant & Curative	NR	A	ALL	Registered in bananas for the control of Leaf Speckle, **Leaf Spot** and Black Sigatoka. DO NOT use on bananas unless bunch covers are in place. Maximum of 4 applications per season, as part of a preventative disease control program. DO NOT apply consecutive sprays of pyraclostrobin or other Group 11 fungicides.	-
Pyrimethanil (Scala) Bayer	9	Protectant	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of **Yellow Sigatoka**, Leaf Speckle and Cordana Leaf Spot. Use a retreatment interval of 14-21 days. Maximum number of treatments not specified.	-
Tebuconazole	3	Protectant & Curative	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot / **Yellow Sigatoka**, Leaf Speckle and Black Sigatoka. Tropical Areas: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14 day intervals. DO NOT use more than 6 applications per season. DO NOT apply during Jul-Sep period Sub-tropical Areas: Commence spraying at the onset of warm and humid/wet weather, normally Dec. Apply at least 2 consecutive applications at 21-28 day interval. DO NOT use more than 5 applications per season.	R3
Trifloxystrobin (Flint) Bayer	11	Protectant & Curative	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of **Yellow Sigatoka**, Black Sigatoka and Cordana Leaf Spot. Should be used as part of a regular protectant program. Intervals between applications generally should be 14-21 days, but should be modified for locality, disease conditions and leaf emergence rates. DO NOT apply consecutive applications and apply a minimum of 2 sprays from a different activity group between any Group 11 fungicides. Tropical Areas: DO NOT use Group 11 fungicides from May-Sep. Maximum of 4 applications per season.	-
Zineb	M3	Protectant	7	A	QLD, NSW & WA	Registered in bananas for control of Cercospora Leaf Spot and Speckle (**Yellow Sigatoka**). Apply as a foliar spray between December and May, using a retreatment interval of 14 days or as required. Maximum number of applications not specified.	R2
Florylpicoxamid (Verpixo Adavelt) Corteva	21	Protectant & Curative		P		Registered in cucurbits, fruiting vegetables, lettuce and strawberry for control of a range of diseases. Currently in development for registration in bananas, with activity on ***Mycosphaerella* spp.** and other leaf diseases.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered in almonds, cherries and macadamias for control of various leaf diseases. US registration for control of Leaf Spot, Powdery Mildew, Anthracnose and Grey Mould in strawberries.	-
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	21	P		Registered in apples for control of Black Spot and in grapes for control of Powdery Mildew. US registration for control of **Mycosphaerella Blight** in legume vegetables.	R3
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered in berries and grapes for control of Botrytis, and in leafy vegetables and potato for control of Botrytis and Sclerotinia. US registration for control of ***Mycosphaerella* sp.** in brassicas.	R3
Sooty Blotch (*Chaetothyrina musarum*) **Priority: High**							
Rated as a high priority in QLD, and as a low priority in NSW & NT. Sooty Blotch has not caused major problems in the past, but it appears to be an emerging priority, especially as growers shift away from bunch dusting to alternative practices. The disease is not well understood and control options are currently limited.							
No control options available							
Crown Rot (*Colletotrichum musae*, *Fusarium* spp., *Musicillium theobromae*) **Priority: High**							
Rated as a high priority in QLD, and as a low priority in NSW & NT. Crown Rot is one of the most serious post-harvest diseases of banana. It develops as the fruit is being stored and ripened in the marketing chain and is the biggest cause of quality impacts for bananas. The appropriate and timely use of post-harvest fungicides is key to reducing disease incidence.							
Prochloraz (Sportak)	3	Protectant / Post-harvest Spray	NR	A	QLD, NSW, WA & NT	Registered in bananas for post-harvest control of **Anthracnose (Black-End)**. Spray fruit for 30 seconds. Use in a non-recirculating spray system only.	R3
Thiabendazole (Tecto)	1	Protectant / Post-harvest Dip	NR	A	NSW, WA	Registered in bananas for post-harvest control of **Crown Rot/Black-End Rot**. After the bananas have passed through the de-handing and/or washing operation, the fruit should be completely dipped for 2-4 minutes	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Azoxystrobin + Fludioxynil (Graduate A+) Syngenta	11+12	Protectant / post-harvest		P		Registered as a dip, drench or flood spray for the control of various post-harvest diseases in avocados.	-
Fludioxynil (Scholar) Syngenta	12	Protectant / post-harvest		P		Registered for the control of various post-harvest diseases in citrus, pome and stone fruit, mangoes, pomegranates and kiwi fruit. Used as a dip or flood spray.	-
Fruit Speckle (*Fusarium oxysporum*, *Fusarium semitectum*) **Priority: Moderate**							
Rated as a moderate priority in QLD, and as a low priority in NSW & NT. Fruit Speckle occurs frequently in bananas and should be managed by a combination of mancozeb sprays and cultural controls, especially de-leafing and de-suckering to remove infection sources. As fruit matures, it becomes less susceptible to infection. Fungicide strategy is highly exposed with high reliance on mancozeb.							
Mancozeb	M3	Protectant	NR	A	ALL	Registered in bananas for control of Leaf Spot, Black Pit, Cordana Leaf Spot, **Fruit Speckle** and Leaf Speckle. Note that addition of spraying oil is required (1 day WHP). Apply when weather conditions favour disease outbreak. NSW / Ground Application: Dec/Jan-May 21 day intervals NSW / Aerial Application: Dec/Jan-May 7-10 day intervals Sth Qld: Dec/Jan-May 21 day intervals Nth Qld, NT: Wet season – 14 day intervals; After and in the lead up to wet season – 21 day intervals; drier months – 28-35 days. Maximum number of treatments not specified.	R2
Mancozeb PER81199	M3	Protectant	35	A	NSW, NT, QLD & WA	Permitted in bananas for control of **Banana Fruit Speckle**. Apply a maximum of 2 foliar dusting applications per season. Apply to emerging bunch before bracts are fully open (i.e. bract lift). Apply again at bunch covering.	R2
Metiram (Polyram)	M3	Protectant	NR	A	ALL	Registered in bagged bananas for the control of Leaf Spot**,** Black Pit, Cordana Leaf Spot, **Fruit Speckle** and Leaf Spot. Note spray oil has a 1 day WHP. Apply when weather conditions favour disease outbreak. NSW / Ground Application: Dec/Jan-May 21 day intervals Sth Qld: Dec/Jan-May 21 day intervals Nth Qld, NT: Wet season – 14 day intervals; After and in the lead up to wet season – 21 day intervals; drier months – 28-35 days.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Petroleum Oil	-	Protectant	1	A	Qld, NSW, WA & NT	Registered in bananas for control of Cercospora Leaf Spot, Leaf Speckle and Cordana Leaf Spot. Apply with mancozeb for control of Leaf Spot, Leaf Speckle, **Fruit Speckle**, Cordana Leaf Spot and Black Sigatoka. Retreatment interval and maximum number of treatments not specified.	-
Streptomyces lydicus (Actinovate) Novozymes Bioag	BM 02	Biological	NR	P-A	ALL	Registered as a biological soil amendment in all crops to supplement the activity of natural soil organisms. Registered for control of Fusarium Wilt in tomato as a foliar application.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	BM 02	Biological	NR	P	ALL	Registered for control of *Botrytis* in grapes and strawberries. US registration for the control of ***Fusarium* spp.** and in artichoke, asparagus, brassica leafy vegetables, bulb vegetables, cucurbits, corn, fruiting vegetables, legume vegetables, oilseeds, soybean, strawberry and root & tuber vegetables.	-
Bacterial Rot / Corm Rot / Soft Rot (*Pectobacterium* spp.) **Priority: Moderate**							
Rated as a moderate priority in QLD & NSW, and as a low priority in NT. Bacterial Rot infections can enter through injuries to fruit, storage root or stem and are favoured in hot, wet weather. No fungicide options are available.							
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in bananas for the control of Cercospora Leaf Spot, Yellow Sigatoka and Phytophthora Stem Canker. Registered for control of various bacterial diseases in stone fruit, mangoes, beans, capsicums, cucurbits, lettuce, peas and tomatoes.	**-**
Bacillus amyloliquefaciens (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.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	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
Banana Leaf Rust (*Uredo musae*) **Priority: Moderate**							
Rated as a moderate priority in QLD & NSW, and as a low priority in NT. Rust is well established in major growing areas and is favoured by humid weather. It is usually controlled by fungicide programs used for other leaf diseases, but no specific control options are available. Recent reports suggest that rust is increasing in incidence, and it is not being controlled as it was previously. It is causing significant production issues on those farms where it is present.							
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	1	P-A	ALL	Registered in bananas for the control of Yellow Sigatoka**,** Leaf Speckle and Cordana Leaf Spot. US registration for control of **Rust** in bulb vegetables, stone fruit and sunflower.	R3
Bacillius amyloliquefaciens (Serifel) BASF	BM02	Biological / Protectant	NR	P		Registered for control of Botrytis in grapes and strawberries. US registration for control of **Rust** in brassica leafy vegetables, corn, pome fruit and tree nuts.	-
Bacillus amyloliquefaciens (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). US registration for control of Rust in pome fruit.	-
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant / Curative		P		Registered for control of various diseases in grapes, berries, leafy vegetables, lettuce and potatoes. US registration for control of **Rust** in bulb vegetables.	R3
Isopyrazam (Seguris) Syngenta	7	Protectant		P		Registered for control of **Rust** in almonds.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Banana Bunchy Top Virus (BBTV) **Priority: Moderate**							
Rated as a moderate priority in QLD & NSW, and as a low priority in NT. BBTV is transmitted by the Banana Aphid. It is a regulated pest, and a containment strategy is in place to prevent the disease from spreading from the containment zone in SE QLD and Northern NSW. Significant industry resources are being employed to management of BBTV. Bunchy Top cannot be cured and infected plants must be destroyed.							
Glyphosate (Roundup) PER14850	M	Destruction of Infected Banana Plants	NR NG	A	ALL	Inject glyphosate mix into the pseudostem above the growing point. Inject suckers up to 1 metre tall at 1 point and taller plants at 2 points around the stem. No fruit from plants treated can be sold or consumed.	R3
Banana Freckle (*Phyllosticta cavendishii*) **Priority: Moderate**							
Rated as a low priority in QLD & NSW, and as a moderate priority in NT. Banana Freckle only affects Cavendish variety. There are no current registrations available for controlling the disease although many of the protectant fungicides used for controlling leaf disease are likely to have activity on Banana Freckle. It is an exotic species which is only in the NT at present. Suspected detections of the disease should be reported to Biosecurity Qld.							
Difenoconazole (Score)	3	Protectant & Curative	1	P-A	QLD, NSW & NT	Registered in bananas for control of Yellow Sigatoka and Black Sigatoka.	R3
Epoxiconazole (Opus)	3	Protectant & Curative	1	P-A	ALL	Registered in bananas for control of Yellow Sigatoka and Leaf Speckle.	R3
Mancozeb	M3	Protectant	NR	P-A	ALL	Registered in bananas for control of Leaf Spot, Black Pit, Cordana Leaf Spot, Fruit Speckle and Leaf Speckle.	R2
Propiconazole (Tilt)	3	Protectant & Curative	1	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot, Leaf Speckle, Cordana Leaf Spot and Black Sigatoka.	R3
Pyraclostrobin (Cabrio)	11	Protectant & Curative	NR	P-A	ALL	Registered in bananas for control of Leaf Speckle, Leaf Spot and Black Sigatoka.	-
Tebuconazole (Folicur)	3	Protectant & Curative	1	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, Leaf Speckle and Black Sigatoka.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Trifloxystrobin (Flint)	11	Protectant & Curative	NR	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, Black Sigatoka and Cordana Leaf Spot.	-
Leaf Speckle (*Mycosphaerella musae*) **Priority: Moderate**							
Rated as a moderate priority in NSW, and as a low priority in QLD & NT. Closely related to Yellow Sigatoka and endemic to all regions except WA. It is a prescribed pest meaning that growers are required to keep Leaf Speckle leaf levels below 5% by state government regulations. Leaf Speckle has the potential to mask an outbreak of the similar looking, but far more destructive exotic disease Black Sigatoka.							
Bacillus amyloliquefaciens Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	44	Protectant	NR	A	ALL	Registered in bananas for control of Yellow Sigatoka and suppression of **Common Leaf Speckle**. Use a retreatment interval of 14-21 days, but should be modified for locality, disease conditions and leaf emergence rates. Maximum number of treatments not specified.	**-**
Chlorothalonil (Bravo)	M5	Protectant	1	A	QLD, NSW, NT & WA	Registered in bananas for the control of Leaf Spot and **Leaf Speckle**. Apply as a protectant with spray intervals: Nth Qld: Jan-Mar 14 days; After Mar 21 days and then 28-35 days during dry months Sth Qld: Dec-Apr 21 days WA: Nov-May 10-14 days; May-Nov 14-21 days NSW: Nov-May 21 days .	R3
Epoxiconazole (Opus 75) BASF	3	Protectant & Curative	1	A	ALL	Registered in bananas for the control of Leaf Spot / Yellow Sigatoka and **Leaf Speckle**. DO NOT use on bananas unless bunch covers are in place. Nth Qld, NT, WA: Apply as a protectant when conditions favour disease. Apply a maximum of 2 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicide per season, do not use during Jul-Sep period. Sth Qld, NSW: Commence spraying at the onset of wet/humid conditions. Maximum of 2 consecutive sprays at 21-28 day intervals. Do not use more than 5 Group 3 fungicides per season.	R3

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fluopyram (Luna Privilege) Bayer	7	Protectant & Curative	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, **Leaf Speckle** and Cordana Leaf Spot. Apply as part of a regular protectant program using a retreatment interval of 14-21 days. Maximum of 4 applications per season.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	1	A	ALL	Registered in bananas for control of Yellow Sigatoka, **Leaf Speckle** and Cordana Leaf Spot. Apply as part of a regular protectant program using a retreatment interval of 14-21 days. Maximum of 4 applications per season.	R3
Fluxapyroxad (Sercadis) BASF	7	Protectant & Curative	NR	A	ALL	Registered in bananas for control of Yellow Sigatoka and **Leaf Speckle**. Apply as part of a preventative disease program at a retreatment interval of 14-21 days. Maximum of 4 applications per season.	-
Isotianil (Routine 200SC) Bayer	P03	Protectant	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka and **Common Leaf Speckle**. Apply as a foliar spray after the uniform 8 leaf stage is reached. Do not apply unless the banana bunches are bagged. Use a minimum retreatment interval of 8 weeks. Maximum of 4 applications per season.	-
Mancozeb	M3	Protectant	NR	A	ALL	Registered in bananas for the control of Leaf Spot and suppression of **Leaf Speckle**, Fruit Speckle, Cordana Leaf Spot and Black Pit. Note that addition of spraying oil is required (1 day WHP). Apply when weather conditions favour disease outbreak. NSW / Ground Application: Dec/Jan-May 21 day intervals NSW / Aerial Application: Dec/Jan-May 7-10 day intervals Sth Qld: Dec/Jan-May 21 day intervals Nth Qld, NT: Wet season – 14 day intervals; After and in the lead up to wet season – 21 day intervals; drier months – 28-35 days Maximum number of treatments not specified.	R2
Petroleum Oil		Protectant	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Cercospora Leaf Spot, Cordana Leaf Spot, **Leaf Speckle** and Black Sigatoka. Apply with a registered fungicide as specified on the label.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Propiconazole (Tilt)	3	Protectant & Curative	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot, **Leaf Speckle**, Cordana Leaf Spot and Black Sigatoka. Must be applied with a water miscible oil. NSW, Sth Qld: Commence spraying at the start of the summer rainy season. Apply at least 2 consecutive applications at 21-28 day interval. Maximum of 5 Group 3 fungicides per season. NT, Nth Qld: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicides per season. DO NOT apply during Jul-Oct period.	R3
Pyraclostrobin (Cabrio) BASF	11	Protectant & Curative	NR	A	ALL	Registered in bananas for the control of **Leaf Speckle**, Leaf Spot and Black Sigatoka. DO NOT use on bananas unless bunch covers are in place. Maximum of 4 applications per season, as part of a preventative disease control program. DO NOT apply consecutive sprays of pyraclostrobin or other Group 11 fungicides.	-
Pyrimethanil (Scala) Bayer	9	Protectant	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, **Leaf Speckle** and Cordana Leaf Spot. Use a retreatment interval of 14-21 days. Maximum number of treatments not specified.	-
Tebuconazole	3	Protectant & Curative	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot/Yellow Sigatoka, **Leaf Speckle** and Black Sigatoka. Tropical Areas: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14 day intervals. DO NOT use more than 6 applications per season. DO NOT apply during Jul-Sep period Sub-tropical Areas: Commence spraying at the onset of warm and humid/wet weather, normally Dec. Apply at least 2 consecutive applications at 21-28 day interval. DO NOT use more than 5 applications per season.	R3
Florylpicoxamid (Verpixo Adavelt) Corteva	21	Protectant & Curative		P		Registered in cucurbits, fruiting vegetables, lettuce and strawberry for control of a range of diseases. Currently in development for registration in bananas, with activity on ***Mycosphaerella* spp.** and other leaf diseases.	-
Fluxapyroxad + Pyraclostrobin (Merivon) BASF	7+11	Protectant & Curative		P		Registered in almonds, cherries and macadamias for control of various leaf diseases. US registration for control of Leaf Spot, Powdery Mildew, Anthracnose and Grey Mould in strawberries.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mefentrifluconazole (Belanty) BASF	3	Protectant & Curative	21	P		Registered in apples for control of Black Spot and in grapes for control of Powdery Mildew. US registration for control of **Mycosphaerella Blight** in legume vegetables.	R3
Pydiflumetofen + Fludioxonil (Miravis Prime) Syngenta	7+12	Protectant & Curative		P		Registered in berries and grapes for control of Botrytis, and in leafy vegetables and potato for control of Botrytis and Sclerotinia. US registration for control of ***Mycosphaerella* sp.** in brassicas.	R3
Tropical Speckle (*Ramichloridium* spp.) **Priority: Moderate**							
Rated as a moderate priority in QLD, and as a low priority in NSW & NT. Symptoms occur on the underside of leaves and are similar to Leaf Speckle. Spores are spread by wind in moist weather. Regular Leaf Spot fungicides should provide incidental control of Tropical Speckle although spray coverage is critical to ensure control is achieved on the underside of leaves.							
Difenoconazole (Score)	3	Protectant & Curative	1	P-A	QLD, NSW & NT	Registered in bananas for control of Yellow Sigatoka and Black Sigatoka.	R3
Epoxiconazole (Opus)	3	Protectant & Curative	1	P-A	ALL	Registered in bananas for control of Yellow Sigatoka and Leaf Speckle.	R3
Mancozeb	M3	Protectant	NR	P-A	ALL	Registered in bananas for control of Leaf Spot, Black Pit, Cordana Leaf Spot, Fruit Speckle and Leaf Speckle.	R2
Propiconazole (Tilt)	3	Protectant & Curative	1	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot, Leaf Speckle, Cordana Leaf Spot and Black Sigatoka.	R3
Pyraclostrobin (Cabrio)	11	Protectant & Curative	NR	P-A	ALL	Registered in bananas for control of Leaf Speckle, Leaf Spot and Black Sigatoka.	-
Tebuconazole (Folicur)	3	Protectant & Curative	1	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, Leaf Speckle and Black Sigatoka.	R3
Trifloxystrobin (Flint)	11	Protectant & Curative	NR	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, Black Sigatoka and Cordana Leaf Spot.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Mokillo (Bacterial Complex) **Priority: Moderate**							
Rated as a moderate priority in QLD, and as a low priority in NSW & NT. Mokillo is caused by a bacterial complex and causes red discolouration of the flesh. No control options are currently available.							
Copper (Cu)	M1	Protectant	1	P-A	ALL	Registered in bananas for the control of Cercospora Leaf Spot, Yellow Sigatoka and Phytophthora Stem Canker. Registered for control of various bacterial diseases in stone fruit, mangoes, beans, capsicums, cucurbits, lettuce, peas and tomatoes.	**-**
Bacillus amyloliquefaciens (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.	-
Bacillus amyloliquefaciens strain MBI 600 (Serifel) BASF	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.	-
Fruit Spot / Black Tip (*Deightoniella torulosa*) **Priority: Low**							
Rated as a low priority in all states. Fruit spot is a minor disease that is generally controlled incidentally by the fungicide program used for other leaf diseases. No specific in-crop fungicides are registered.							
Thiabendazole (Tecto) Syngenta	1	Protectant / Post-Harvest Dip	NR	A	NSW, WA	Registered in bananas for post-harvest control of Squirter Disease, Black-End Rot, Crown Rot and *Fusarium, **Deightoniella**, Verticillium* spp. After the bananas have passed through the dehanding and/or washing operation, the fruit should be completely dipped for 2-4 minutes	**-**

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Anthracnose / Post-Harvest (*Colletotrichum musae*) **Priority: Low**							
Rated as a low priority in all states. Caused by the same pathogen as Crown Rot, anthracnose can cause other post-harvest defects in bananas. It develops as the fruit is being stored and ripened in the marketing chain. The appropriate and timely use of post-harvest fungicides is key to reducing disease incidence.							
Prochloraz (Sportak)	3	Protectant / Post-Harvest Spray	NR	A	QLD, NSW, WA & NT	Registered in bananas for post-harvest control of **Anthracnose (Black-End)**. Spray fruit for 30 seconds Use in a non-recirculating spray system only.	R3
Thiabendazole (Tecto) Syngenta	1	Protectant / Post-Harvest Dip	NR	A	NSW, WA	Registered in bananas for post-harvest control of Squirter Disease, **Black-End Rot**, Crown Rot and *Fusarium, Deightoniella, Verticillium* spp. After the bananas have passed through the dehanding and/or washing operation, the fruit should be completely dipped for 2-4 minutes	**-**
Azoxystrobin + Fludioxynil (Graduate A+) Syngenta	11+12	Protectant / post-harvest		P		Registered as a dip, drench or flood spray for the control of various post-harvest diseases in avocados.	**-**
Fludioxynil (Scholar) Syngenta	12	Protectant / post-harvest		P		Registered for the control of various post-harvest diseases in citrus, pome and stone fruit, mangoes, pomegranates and kiwi fruit. Used as a dip or flood spray.	**-**
Cigar End Tip Rot (*Verticillium* spp.) **Priority: Low**							
Rated as a high priority in NSW, and as a low priority in QLD & NT. Cigar End Tip Rot is a minor disease that has minimal impacts on banana quality. The appropriate and timely use of post-harvest fungicides is key to reducing disease incidence.							
Thiabendazole (Tecto) Syngenta	1	Protectant / Post-Harvest Dip	NR	A	NSW, WA	Registered in bananas for post-harvest control of Squirter Disease, Black-End Rot, Crown Rot and *Fusarium, Deightoniella,* ***Verticillium*** **spp.** After the bananas have passed through the dehanding and/or washing operation, the fruit should be completely dipped for 2-4 minutes	**-**

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Azoxystrobin + Fludioxynil (Graduate A+) Syngenta	11+12	Protectant / post-harvest		P		Registered as a dip, drench or flood spray for the control of various post-harvest diseases in avocados.	-
Fludioxynil (Scholar) Syngenta	12	Protectant / post-harvest		P		Registered for the control of various post-harvest diseases in citrus, pome and stone fruit, mangoes, pomegranates and kiwi fruit. Used as a dip or flood spray.	-
Cordana Leaf Spot (*Cordana musae*) **Priority: Low**							
Rated as a moderate priority in NSW, and as a low priority in QLD & NT. Usually of minor importance in Cavendish bananas. Severe infections may not have a large impact on yields. Several fungicide options are available for managing the disease.							
Fluopyram (Luna Privilege) Bayer	7	Protectant & Curative	NR	A	QLD, NSW, WA & NT	Registered in bananas for the control of Yellow Sigatoka**,** Leaf Speckle and **Cordana Leaf Spot**. Apply as part of a regular protectant program using spray intervals of 14-21 days. Maximum of 4 applications per season.	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7+3	Protectant & Curative	1	A	ALL	Registered in bananas for the control of Yellow Sigatoka**,** Leaf Speckle and **Cordana Leaf Spot**. Apply as part of a regular protectant program using spray intervals of 14-21 days. Maximum of 4 applications per season.	R3
Mancozeb	M3	Protectant	NR	A	ALL	Registered in bananas for the control of Leaf Spot and suppression of Leaf Speckle, Fruit Speckle, **Cordana Leaf Spot** and Black Pit. Note that addition of spraying oil is required (1 day WHP). Apply when weather conditions favour disease outbreak. NSW / Ground Application: Dec/Jan-May 21 day intervals NSW / Aerial Application: Dec/Jan-May 7-10 day intervals Sth Qld: Dec/Jan-May 21 day intervals Nth Qld, NT: Wet season – 14 day intervals; After and in the lead up to wet season – 21 day intervals; drier months – 28-35 days Maximum number of treatments not specified.	R2

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Metiram (Polyram)	M3	Protectant	NR	A	ALL	Registered in bagged bananas for the control of Leaf Spot**,** Black Pit, **Cordana Leaf Spo**t, Fruit Speckle and Leaf Spot. Note spray oil has a 1 day WHP. Apply when weather conditions favour disease outbreak. NSW / Ground Application: Dec/Jan-May 21 day intervals Sth Qld: Dec/Jan-May 21 day intervals Nth Qld, NT: Wet season – 14 day intervals; After and in the lead up to wet season – 21 day intervals; drier months – 28-35 days.	R2
Petroleum Oil	-	Protectant	1	A	QLD, NSW, WA & NT	Registered for control of Cercospora Leaf Spot, **Cordana Leaf Spot**, Leaf Speckle and Black Sigatoka in bananas. Apply with a registered fungicide as specified on the label. Retreatment interval and maximum number of applications not specified.	**-**
Propiconazole (Tilt)	3	Protectant & Curative	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Leaf Spot, Leaf Speckle, **Cordana Leaf Spot** and Black Sigatoka. Must be applied with a water miscible oil. NSW, Sth Qld: Commence spraying at the start of the summer rainy season. Apply at least 2 consecutive applications at 21-28 day interval. Maximum of 5 Group 3 fungicides per season. NT, Nth Qld: Commence spraying at the start of the wet season. Apply at least 2 but no more than 3 consecutive sprays at 14-21 day intervals. Maximum of 6 Group 3 fungicides per season. DO NOT apply during Jul-Oct period.	R3
Pyrimethanil (Scala) Bayer	9	Protectant	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, Leaf Speckle and **Cordana Leaf Spot**. Intervals between fungicide applications should be 14-21 days, but should be modified for locality, disease conditions and leaf emergence rates.	**-**
Trifloxystrobin (Flint) Bayer	11	Protectant & Curative	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Yellow Sigatoka, Black Sigatoka and **Cordana Leaf Spot**. Intervals between fungicide applications should be 14-21 days, but should be modified for locality, disease conditions and leaf emergence rates. DO NOT use consecutive applications. In the tropics, DO NOT apply Group 11 sprays from May-Sep. DO NOT use more than 4 applications of any Group 11 fungicide per season.	**-**

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Florylpicoxamid (Verpixo Adavelt) Corteva	21	Protectant & Curative		P		Registered in cucurbits, fruiting vegetables, lettuce and strawberry for control of a range of diseases. Currently in development for registration in bananas, with activity on ***Mycosphaerella* spp.** and other leaf diseases.	-
Ripe Fruit Spot / Post-Harvest (*Gloeosporium* spp.) **Priority: Low**							
Rated as a low priority in all states. Ripe Fruit Spot is a minor disease that has minimal impacts on banana quality. The appropriate and timely use of post-harvest fungicides is key to reducing disease incidence.							
Thiabendazole (Tecto) Syngenta	1	Protectant / Post-Harvest Dip	NR	A	NSW, WA	Registered in bananas for post-harvest control of Squirter Disease, **Black-End Rot**, Crown Rot and *Fusarium, Deightoniella, Verticillium* spp. After the bananas have passed through the de-handing and/or washing operation, the fruit should be completely dipped for 2-4 minutes	-
Azoxystrobin + Fludioxynil (Graduate A+) Syngenta	11+12	Protectant / post-harvest		P		Registered as a dip, drench or flood spray for the control of various post-harvest diseases in avocados.	-
Fludioxynil (Scholar) Syngenta	12	Protectant / post-harvest		P		Registered for the control of various post-harvest diseases in citrus, pome and stone fruit, mangoes, pomegranates and kiwi fruit. Used as a dip or flood spray.	-
Squirter / Post-Harvest (*Nigrospora musae*, *Nigrospora sphaerica*) **Priority: Low**							
Rated as a low priority in all states. The appropriate and timely use of post-harvest fungicides is key to reducing incidence of Squirter. The disease may be a problem in fully ripe fruit sent to interstate markets during winter or in chilled fruit that has undergone an extended ripening period.							
Thiabendazole (Tecto) Syngenta	1	Protectant / Post-Harvest Dip	NR	A	NSW, WA	Registered in bananas for post-harvest control of **Squirter Disease**, Black-End Rot, Crown Rot and *Fusarium, Deightoniella, Verticillium* spp. After the bananas have passed through the de-handing and/or washing operation, the fruit should be completely dipped for 2-4 minutes	-
Azoxystrobin + Fludioxynil (Graduate A+) Syngenta	11+12	Protectant / post-harvest		P		Registered as a dip, drench or flood spray for the control of various post-harvest diseases in avocados.	-

Disease / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Regulatory risk
Fludioxynil (Scholar) Syngenta	12	Protectant / post-harvest		P		Registered for the control of various post-harvest diseases in citrus, pome and stone fruit, mangoes, pomegranates and kiwi fruit. Used as a dip or flood spray.	-

4.2 Insect and other pests of Bananas

4.2.1 Insect and other pest priorities

Insects and Other Pests	Priority
Banana Scab Moth (*Nacoleia octasema*)	H
Banana Weevil Borer (*Cosmopolites sordidus*)	H
Banana Spider Mite / Strawberry Mite (*Tetranychus lambi*)	H
Banana Flower Thrips (*Thrips hawaiiensis*)	H
Banana Rust Thrips (*Chaetanaphothrips signipennis*)	H
Sugarcane Bud Moth (*Opogona glycyphaga*)	M
Two Spotted Mite (*Tetranychus urticae*)	M
Burrowing Nematode (*Radopholus similis*)	M
Root-knot Nematode (*Meloidogyne* spp.)	M
Banana Spiral Nematode (*Helicotylenchus multicinctus*)	M
Lesion Nematodes (*Pratylenchus* spp.)	M
Banana Aphid (*Pentalonia nigronervosa*)	L
Cane Grub / White Grub (*Lepidiota* spp.)	L
Banana-Silvering Thrips (*Hercinothrips bicinctus*)	L
Banana Fruit Caterpillar (*Tiracola plagiata*)	L
Cluster Caterpillar (*Spodoptera litura*)	L
Queensland Fruit Fly (*Bactrocera tryoni*)	L
Oriental Fruit Fly (*Bactrocera dorsalis*)	L
Mealy Bugs (*Pseudococcus jackbeardsleyi*)	L
Scale (Coccidae)	L
Banana Spotting Bug (*Amblypelta lutescens*)	L
Fruit Spotting Bug (*Amblypelta nitida*)	L
Fruit Piercing Moth (*Eudocima* spp.)	L
Reniform Nematode (*Rotylenchulus reniformis*)	L

Bananas are impacted by a wide variety of insect and other pests, with Banana Scab Moth, Banana Weevil Borer, Banana Spider Mite / Strawberry Mite, Banana Flower Thrips and Banana Rust Thrips rated as high priority pests.

It is important to take an Integrated Pest Management (IPM) Approach to pest control in bananas. 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 bananas necessitates careful planning with resistance management. Growers should refer to resistance management strategies for Banana Weevil Borer and Rust Thrips listed on the CropLife website[6].

[6] https://www.croplife.org.au/resources/programs/resistance-management/banana-banana-weevil-borer-and-rust-thrips/

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 6)	
A	Available via either registration or permit approval	R1	Short-term: Critical concern over retaining access
P	Potential - a possible candidate to pursue for registration or permit	R2	Medium-term: Maintaining access of significant concern
P-A	Potential, already approved in the crop for another use	R3	Long-term: Potential issues associated with use - Monitoring required
Withholding Period (WHP) – Number of days from last treatment to harvest (H) or Grazing (G)			
Harvest	H	Not Required when used as directed	NR
Grazing	G	No Grazing Permitted	NG
IPM – indicative overall impact on beneficials (based on the Cotton Pest Management Guide 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
Banana Scab Moth (*Nacoleia octasema*) **Priority: High**								
Rated as a high priority in QLD, and as a low priority in NSW & NT. Banana Scab Moth is only found in North Qld, north of Ingham. It is a major and frequent pest and the larvae cause superficial scarring on young fruit. Damaged areas form a black callous, rendering the fruit unmarketable. Careful selection of following suckers of equal size ensures concentrated bunching cycle to streamline control and a range of spiders and general predators assist in managing the pest. Bunch injection is recommended to promote biological control. Injection must be carried out when the bunch is still upright in the throat of the plant.								
Acephate (Orthene)	1B	Contact	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of **Banana Scab Moth**, Banana Flower Thrips and Banana Rust Thrips. Apply as a bell injection. Inject directly into the upright bell as it emerges from the throat of the banana plant.	H Bee:H	R3
Bifenthrin (Talstar 80SC)	3A	Contact	NR	A	QLD, NSW	Registered in bananas for control of **Banana Scab Moth** and Flower Thrips. Apply as a bell injection as it emerges from the throat of the banana plant while in the upright position. The correct site for injection is the top half to one third of the bell just below the distinct swelling where the male flower mass ends and the female flower cavity (bottom hand of fruit) start. Treatments per season not limited.	VH Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorpyrifos (Lorsban)	1B	Contact	14	A	QLD, NSW	Registered in bananas for control of **Banana Scab Moth**, Banana Weevil Borer and Caterpillars. Apply as a cover spray from the first appearance of flower bell and repeat as populations indicate until fingers are exposed. Burning of young fruit may occur under poor drying conditions. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Chlorpyrifos (Lorsban) PER14240	1B	Contact	14	A	NSW, QLD, NT & WA	Permitted in bananas for control of Sugar Cane Bud Moth, **Banana Scab Moth**, Banana Rust Thrips, Mealybugs and caterpillars. Apply as a dust to the inside of the bunch cover and the fruit. Mix product with a talc and ensure dusting occurs within 1 week of bunch covering. Maximum of one application per season. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Spinetoram (Success Neo) Corteva PER87198	5	Contact & Ingestion	NR	A	NSW, NT, QLD & WA	Permitted in bananas for control of Banana Rust Thrips, Banana Flower Thrips and Flower Eating Caterpillars such as Sugarcane Bud Moth and **Scab Moth**. DO NOT make more than 1 application per crop at bell emergence using a bell injector. Make the bell injection in the top half to one third of the emerging bell while the newly emerged bells are still upright. Maximum of one application as a bunch spray following use as a bell injection.	M Bee:VH	-
Bacillus thuringiensis (DiPel DF)	11	Biological	NR	P-A	ALL	Registered in fruit for control of susceptible lepidopteran larvae.	VL Bee:L	-
Tetraniliprole (Vayego Forte) Bayer	28	Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Weevil Borer.	L-M Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potatoes), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, 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, Rubus spp., pome fruit, stone fruit, strawberries, grapes and macadamias.	L 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	-
Methoxyfenozide (Prodigy)	18	Ingestion		P		Registered for control of various lepidopteran pests in almonds, pome fruit, avocado, blueberry, citrus, coffee, custard apple, grapevines, kiwifruit, longan, lychee, macadamia and fruiting vegetables.	VL Bee:VL	-
Tebufenozide (Mimic)	18	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, grapevines, 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
Banana Weevil Borer (*Cosmopolites sordidus*) **Priority: High**								
Rated as a high priority in QLD & NSW, and as a low priority in NT. Banana Weevil Borer can cause significant damage to bananas. Cultural controls such as using weevil-free planting material and general plantation hygiene play an important part of managing the pest. Insecticide options are generally older and disruptive chemistry. Insecticide resistance is a threat with the current options available.								
Bifenthrin (Talstar)	3A	Contact	1	A	QLD, NSW, WA & NT	Registered in bananas for control of **Banana Weevil Borer**, Banana Rust Thrips and Strawberry Spider Mite. Can be applied as a stool or band treatment. Apply either as a regular seasonal program (twice per year) or based on monitoring in traps.	VH Bee:H	R3
Bifenthrin (Talstar) PER89389	3A	Contact	NR NG	A	QLD	Permitted in bananas (Within Panama Disease Tropical Race 4 Destruction Zone) for control of **Banana Weevil Borer** *Cosmopoliles sordidus*). For stool treatment, remove trash from base of plants prior to application. Do not remove trash from the base of known infected plants as this will increase the risk of Panama disease TR4 inoculum dispersal. Apply as a foliar treatment by ground application with boom sprayer, knapsack, or handgun sprayer. Treat the bottom 30 cm of each stool as well as the soil in a 30 cm band around each stool. For band treatment apply a 0.5 m wide band spray to the soil, following the perimeter of and external to the destruction zone fencing. Repeat the application 5 – 6 months later.	VH Bee:H	R3
Cadusafos (Rugby)	1B	Contact	14	A	QLD	Registered in bananas for control of Burrowing Nematode, Root-Knot Nematode, Spiral Nematode and **Banana Weevil Borer**. Remove trash from base of stool and apply granules evenly to the soil surface in the area covered by a 30 cm radius around each stool. For best results apply just prior to irrigation or rainfall.	H Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorpyrifos (Lorsban)	1B	Contact	14	A	QLD, NSW	Registered in bananas for control of Banana Scab Moth, **Banana Weevil Borer** and Caterpillars. Apply as a cover spray from the first appearance of flower bell and repeat as populations indicate until fingers are exposed. Burning of young fruit may occur under poor drying conditions. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Clothianidin (Shield) Sumitomo	4A	Contact	NR	A	ALL	Registered in bananas for control of **Weevil Borer** and Rust Thrips. Apply to the pseudostem of the main daughter plant when it is a height of 1.5m to the base of the central cigar leaf, preferably within 1 month of the bunch on the mother plant being harvested. Apply either by stem injection or stem spray.	M Bee:VH	R2
Diazinon	1B	Contact	14	A	QLD	Registered in bananas for control of **Banana Beetle Borer** and Banana Rust Thrips. Ensure good coverage of fingers and penetration inside bunch. Apply as required when the bunch is fully emerged until bracts have fallen. Apply every 14 days between Nov and Mar in North Qld.	H Bee:H	R1
Fipronil (Regent)	2B	Contact & Ingestion	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Banana Rust Thrips and **Banana Weevil Borer**. Apply in spring and/or autumn when weevil numbers reach or exceed acceptable threshold levels. Remove any green trash from the area to be treated and apply as a butt application to a height of 30cm and the soil/trash in a 30 cm radius from the stem base. Retreatment interval and maximum number of treatments not specified.	M Bee:VH	R3
Imidacloprid (Confidor Guard)	4A	Contact & Ingestion	NR	A	QLD, NSW, NT & WA	Registered in bananas for control of Banana Rust Thrips and **Banana Weevil Borer**. Do not inject bunched plants. Select the best follower and inject into the base. Injection can occur any time within 3 months after harvest of the mother plant or nurse-suckering. Injection to plants smaller than 1.5 m tall may result in plant injury.	M Bee:M	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Oxamyl (Vydate) Corteva	1A	Contact	NR NG	A	NSW, QLD, NT & WA	Registered in bananas for control of **Banana Weevil Borer** (*Cosmopolites sordidus*), Burrowing Nematode (*Radopholus similis*) and Spiral Nematode (*Heliocotylenchus* spp.) Apply by spotgun to moist soil that is free of trash and weeds. Begin applications in spring when pest activity is on the increase. Apply at intervals of 3 months with 3 applications per season.	H Bee:H	-
Prothiofos (Tokuthion)	1B	Contact	NR	A	QLD, NSW, NT & WA	Registered in bananas for control of **Banana Weevil Borer**. Apply as a base spray to the lower 30 cm of the butt and to the surrounding soil to a radius of 30cm. Apply at time of maximum weevil activity in spring or late summer/autumn. Can also be applied as a bait in harvested or fallen stools or as a stem injection in residual plants.	H Bee:H	-
Spirotetramat + Imidacloprid (Movento Energy) Bayer	23+4A	Contact & Ingestion	NR	A	QLD, NSW, NT & WA	Registered in bananas for control of Banana Rust Thrips and **Banana Weevil Borer**. Do not treat plants after bell emergence. Select the best follower and inject into the base. Injection can occur any time within 3 months after harvest of the mother plant or nurse-suckering. To limit the risk of plant damage, inject only those followers that are at least 1 m tall to the throat of the plant.	M Bee:M	R3
Terbufos (Counter)	1B	Contact	NR	A	ALL	Registered in bananas for control of **Banana Weevil Borer** and Burrowing Nematode. Re-apply at 4 monthly intervals as required. Use a backpack granular applicator to apply to individual trees / followers or use a tractor granular applicator to apply a continuous band either side of the tree line.	H Bee:H	R3
Tetraniliprole (Vayego Forte) Bayer	28	Ingestion	NR	A	ALL	Registered in bananas for control of **Banana Weevil Borer**. Apply as a stem injection. Injection should occur 15 cm from the base of the plant at an off-centre, downward angle to a depth of 5 to 10 cm. Do not treat any follower more than once. Do not treat bunched plants. Treatment can occur at any time within 3 months after harvest of the mother plant or nurse suckering. At treatment the follower plant should be at the required stage at least 3 months prior to bell emergence. DO NOT treat after bell emergence.	L-M Bee:L	-

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 weevil pests in asparagus, celery, pome fruit, stone fruit, strawberries, grapes and macadamias.	L Bee:H	R3
Banana Spider Mite / Strawberry Mite (*Tetranychus lambi*) **Priority: High**								
Rated as a high priority in QLD & NSW, and as a moderate priority in NT. Banana Spider Mite is widely distributed in all growing regions. Activity is mainly confined to dry spring and summer periods. Severe outbreaks are usually associated with the use of cover sprays of broad-spectrum insecticides. Controlling dust and general plantation hygiene are important cultural controls. There are several predatory insects that feed on mite populations so limiting the use of disruptive insecticides will assist with biological control. Growers are reporting reduced efficacy for bifenthrin which may indicate development of resistance.								
Bifenthrin (Talstar 100EC / 250EC)	3A	Contact	8	A	QLD, WA	Registered in bananas for control of **Strawberry Spider Mite** (*Tetranychus lambi*). Apply as a foliar treatment before mite numbers build to damaging levels. Use a retreatment interval of 10-14 days. Maximum number of treatments not specified.	VH Bee:H	R3
Clofentezine (Apollo)	10A	IGR / Contact	NR	A	QLD, NSW & WA	Registered for control of Two-Spotted Mite and **Strawberry Spider Mite** in banana. Apply when mites first appear. Apply a registered knockdown miticide for subsequent applications. Maximum of 1 application per season.	L Bee:L	-
Ethyl Formate (Vapormate)		Post-Harvest Fumigation	NR	A	ALL	Registered in bananas for post-harvest control of **Mites**, Mealybugs, Scale and Coffee Bean Weevil. Requires 6 hours of exposure in an enclosed chamber or box with a sealed plastic bag inside, at a temperature greater than 15 degrees Celsius. Users must be trained under a BOC approved training program.		-
Etoxazole (Paramite)	10B	IGR / Contact	1	A	ALL	Registered in bananas for control of **Strawberry Spider Mite**. Apply at the first signs of an increase in the population of mite crawlers. Once large numbers of adults are present it may be necessary to also apply a miticide from a different group to control the adults immediately and reduce the potential damage.	L Bee:VL	-
Fenbutatin Oxide (Torque)	12A	Contact	1	A	QLD, NSW & NT	Registered in bananas for control of Two-Spotted Mite and **Banana Spider Mite**. Apply according to pest incidence, well before a dense infestation develops. Repeat as required.	L Bee:L	R2

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	Soft option in fruit for control of aphids, thrips, mealybug, **spider mite** and whitefly. Use as a cover spray.	L Bee:L	-
Pyridaben (Sanmite)	21A	IGR / Contact	1	A	QLD, NSW, WA & NT	Registered in bananas for control of **Strawberry Spider Mite** and Two-Spotted Mite. Apply when mite populations persist at a high level and damage to sensitive parts such as spearpoint suckers is evident.	H Bee:H	-
Sulfur PER9409	UN	Contact	NR	A	NSW, QLD	Permitted in bananas for control of **mites**. Apply using duster shortly after bell emergence. Apply dust evenly to avoid heavy localised deposits which will result in unwanted visual residues of sulfur. Application is to be confined to fruit, avoiding leaves as much as possible as sulfur deposits will interfere with beneficial insect activity.	M-H Bee:H	-
Propargite (Omite)	12C	Contact	7	P-A	QLD, NSW, ACT & WA	Registered in bananas for control of Two-Spotted Mite.	M Bee:L	R3
Beauveria bassiana (Velifer) BASF	UN	Ingestion		P		Biological currently registered in protected vegetables and ornamentals, with activity on mites.	L Bee:L	-
Bifenazate (Acramite) Arysta	20D	Contact & Ingestion		P		Registered for mite control in various crops.	L Bee:H	-
Cyflumetofen (Danisaraba) BASF	25A	Contact		P		Registered for control of various Mites in pome fruit, almonds, citrus, grapes, strawberries, fruiting vegetables 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	-
Banana Flower Thrips (*Thrips hawaiiensis*) **Priority: High**								
Rated as a high priority in QLD, and as a moderate priority in NSW & NT. Banana Flower Thrips are present in all growing regions. A range of predatory insects assist to reduce plant populations. The removal of the male "bell" where adult thrips move after all hands are exposed, may help in reducing thrips populations. Bunch injection treatments are recommended to reduce disruption of beneficial species that occurs with using cover sprays.								
Acephate (Orthene)	1B	Contact	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Banana Scab Moth, **Banana Flower Thrips** and Banana Rust Thrips. Apply as a bell injection. Inject directly into the upright bell as it emerges from the throat of the banana plant.	H Bee:H	R3
Bifenthrin (Talstar 80SC)	3A	Contact	NR	A	QLD, NSW	Registered in bananas for control of Banana Scab Moth and **Flower Thrips**. Apply as a bell injection as it emerges from the throat of the banana plant while in the upright position. The correct site for injection is the top half to one third of the bell just below the distinct swelling where the male flower mass ends and the female flower cavity (bottom hand of fruit) start. Treatments per season not limited.	VH Bee:H	R3
Potassium Salts of Fatty Acid (Natrasoap)		Contact	NR	A	ALL	Soft option in fruit for control of aphids, **thrips**, mealybug, spider mite and whitefly. Use as a cover spray.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinetoram (Success Neo) Corteva PER87198	5	Contact & Ingestion	NR	A	NSW, NT, QLD & WA	Permitted in bananas for control of Banana Rust Thrips, **Banana Flower Thrips** and Flower Eating Caterpillars such as Sugarcane Bud Moth and Scab Moth. DO NOT make more than 1 application per crop at bell emergence using a bell injector. Make the bell injection in the top half to one third of the emerging bell while the newly emerged bells are still upright. Maximum of one application as a bunch spray following use as a bell injection.	M Bee:VH	-
Fipronil (Regent)	2B	Contact & Ingestion	NR	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Banana Rust Thrips and Banana Weevil Borer.	M Bee:VH	R3
Spinosad (Entrust Organic) Corteva	5	Contact & Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Rust Thrips and Sugarcane Bud Moth.	L Bee:H	-
Spirotetramat + Imidacloprid (Movento Energy) Bayer	23+4A	Contact & Ingestion	NR	P-A	QLD, NSW, NT & WA	Registered in bananas for control of Banana Rust Thrips and Banana Weevil Borer.	M Bee:M	R3
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Registered for suppression of various Thrips in bulb vegetables, fruiting vegetables, cucurbits, potatoes and strawberries.	L-M Bee:VH	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. US registration for control of various Thrips in berries, citrus, fruiting vegetables and tropical & subtropical fruit.	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	-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of various Thrips in green beans, celery, rhubarb, fruiting vegetables, herbs, lettuce, bulb onions, bulb vegetables, citrus and grapes.	M Bee:L	-
Banana Rust Thrips (*Chaetanaphothrips signipennis*) **Priority: High**								
Rated as a high priority in QLD, a moderate priority in NSW, and as a low priority in NT. Banana Rust Thrips are a major and frequent pest. They can have a major impact on fruit appearance which can lead to downgrading or rejection at market. Clean planting material and bunch covers can help along with general insect predators. Chemical control should be directed at both the soil-dwelling pupal stage and adults and larvae on the fruit and plant. Failure to control the pest at both sites will result in continual reinfestation.								
Acephate (Orthene)	1B	Contact	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of Banana Scab Moth, Banana Flower Thrips and **Banana Rust Thrips**. Apply as a bell injection. Inject directly into the upright bell as it emerges from the throat of the banana plant.	H Bee:H	R3
Bifenthrin (Talstar 100EC / 250EC)	3A	Contact	1	A	QLD, NSW, WA, NT	Registered in bananas for control of Banana Weevil Borer (*Cosmopoliles sordidus*) and **Banana Rust Thrips** (*Chaetanaphothrips signipennis*). Can be applied as a stool or band treatment. Apply either as a regular seasonal program (twice per year) or based on monitoring in traps.	VH Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorpyrifos (Lorsban) PER14240	1B	Contact	14	A	NSW, QLD, NT & WA	Permitted in bananas for control of Sugar Cane Bud Moth, Banana Scab Moth, **Banana Rust Thrips**, Mealybugs and caterpillars. Apply as a dust to the inside of the bunch cover and the fruit. Mix product with a talc and ensure dusting occurs within 1 week of bunch covering. Maximum of one application per season. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Clothianidin (Shield) Sumitomo	4A	Contact	NR	A	ALL	Registered in bananas for control of Weevil Borer and **Rust Thrips**. Apply to the pseudostem of the main daughter plant when it is a height of 1.5m to the base of the central cigar leaf, preferably within 1 month of the bunch on the mother plant being harvested. Apply either by stem injection or stem spray.	M Bee:VH	R2
Diazinon	1B	Contact	14	A	QLD	Registered in bananas for control of Banana Beetle Borer and **Banana Rust Thrips**. Ensure good coverage of fingers and penetration inside bunch. Apply as required when the bunch is fully emerged until bracts have fallen. Apply every 14 days between Nov and Mar in North Qld.	H Bee:H	R1
Fipronil (Regent)	2B	Contact & Ingestion	NR	A	QLD, NSW, WA & NT	Registered in bananas for control of **Banana Rust Thrips** and Banana Weevil Borer. Application should ideally be made at least 2 months prior to bunch emergence. Can be applied as a butt application or a band application.	M Bee:VH	R3
Imidacloprid (Confidor Guard)	4A	Contact & Ingestion	NR	A	NTH QLD, NT, NTH WA	Registered in bananas for control of **Banana Rust Thrips** and Banana Weevil Borer. Do not inject bunched plants. Select the best follower and inject into the base. Injection can occur any time within 3 months after harvest of the mother plant or nurse-suckering. Injection to plants smaller than 1.5 m tall may result in plant injury.	M Bee:M	R2
Potassium Salts of Fatty Acid (Natrasoap)		Contact	NR	A	ALL	Soft option in fruit for control of aphids, **thrips**, mealybug, spider mite and whitefly. Use as a cover spray.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinetoram (Success Neo) Corteva	5	Contact & Ingestion	NR	A	ALL	Registered in bananas for control of **Banana Rust Thrips** and Sugarcane Bud Moth. Apply as a bunch spray no later than 2 weeks after bunch emergence and immediately after placement of the bunch cover. Maximum of 2 applications per crop.	M Bee:VH	-
Spinetoram (Success Neo) Corteva PER87198	5	Contact & Ingestion	NR	A	NSW, NT, QLD & WA	Permitted in bananas for control of **Banana Rust Thrips**, Banana Flower Thrips and Flower Eating Caterpillars such as Sugarcane Bud Moth and Scab Moth. DO NOT make more than 1 application per crop at bell emergence using a bell injector. Make the bell injection in the top half to one third of the emerging bell while the newly emerged bells are still upright. Maximum of one application as a bunch spray following use as a bell injection.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Contact & Ingestion	NR	A	ALL	Registered in bananas for control of **Banana Rust Thrips** and Sugarcane Bud Moth. Apply as a bunch spray no later than 2 weeks after bunch emergence and immediately after placement of the bunch cover. Maximum of 2 applications per crop.	L Bee:H	-
Spirotetramat + Imidacloprid (Movento Energy) Bayer	23+4A	Contact & Ingestion	NR	A	QLD, NSW, NT & WA	Registered in bananas for control of **Banana Rust Thrips** and Banana Weevil Borer. Do not treat plants after bell emergence. Select the best follower and inject into the base. Injection can occur any time within 3 months after harvest of the mother plant or nurse-suckering. To limit the risk of plant damage, inject only those followers that are at least 1 m tall to the throat of the plant.	M Bee:M	R3
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Registered for suppression of various Thrips in bulb vegetables, fruiting vegetables, cucurbits, potatoes and strawberries.	L-M Bee:VH	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. US registration for control of various Thrips in berries, citrus, fruiting vegetables and tropical & subtropical fruit.	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	-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of various Thrips in green beans, celery, rhubarb, fruiting vegetables, herbs, lettuce, bulb onions, bulb vegetables, citrus and grapes.	M Bee:L	-
Sugarcane Bud Moth (*Opogona glycyphaga*) **Priority: Moderate**								
Rated as a moderate priority in QLD & NT, and as a low priority in NSW. Sugarcane Bud Moth causes damage to bananas in all growing regions. Larvae cause superficial damage to the fruit by feeding in the surface of the fruit after the bracts have fallen. The current practice of applying insecticide when the bunch covers are applied is effective at protecting the fruit from damage. Loss of access to key products may lead to this pest increasing in significance.								
Chlorpyrifos (Lorsban)	1B	Contact	14	A	QLD, NSW	Registered in bananas for control of Banana Scab Moth, Banana Weevil Borer and **Caterpillars**. Apply as a cover spray from the first appearance of flower bell and repeat as populations indicate until fingers are exposed. Burning of young fruit may occur under poor drying conditions. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorpyrifos (Lorsban) PER14240	1B	Contact	14	A	NSW, QLD, NT & WA	Permitted in bananas for control of **Sugar Cane Bud Moth**, Banana Scab Moth, Banana Rust Thrips, Mealybugs and caterpillars. Apply as a dust to the inside of the bunch cover and the fruit. Mix product with a talc and ensure dusting occurs within 1 week of bunch covering. Maximum of one application per season. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Spinetoram (Success Neo) Corteva	5	Contact & Ingestion	NR	A	ALL	Registered in bananas for control of Banana Rust Thrips and **Sugarcane Bud Moth**. Apply as a bunch spray no later than 2 weeks after bunch emergence and immediately after placement of the bunch cover. Maximum of 2 applications per crop.	M Bee:VH	-
Spinetoram (Success Neo) Corteva PER87198	5	Contact & Ingestion	NR	A	NSW, NT, QLD & WA	Permitted in bananas for control of Banana Rust Thrips, Banana Flower Thrips and Flower Eating Caterpillars such as **Sugarcane Bud Moth** and Scab Moth. DO NOT make more than 1 application per crop at bell emergence using a bell injector. Make the bell injection in the top half to one third of the emerging bell while the newly emerged bells are still upright. Maximum of one application as a bunch spray following use as a bell injection.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Contact & Ingestion	NR	A	ALL	Registered in bananas for control of Banana Rust Thrips and **Sugarcane Bud Moth**. Apply as a bunch spray no later than 2 weeks after bunch emergence and immediately after placement of the bunch cover. Maximum of 2 applications per crop.	L Bee:H	-
Bacillus thuringiensis (DiPel DF)	11	Biological	NR	P-A	ALL	Registered in fruit for control of susceptible lepidopteran larvae.	VL Bee:L	-
Tetraniliprole (Vayego Forte) Bayer	28	Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Weevil Borer.	L-M Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potatoes), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, 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, Rubus spp., pome fruit, stone fruit, strawberries, grapes and macadamias.	L 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	-
Methoxyfenozide (Prodigy)	18	Ingestion		P		Registered for control of various lepidopteran pests in almonds, pome fruit, avocado, blueberry, citrus, coffee, custard apple, grapevines, kiwifruit, longan, lychee, macadamia and fruiting vegetables.	VL Bee:VL	-
Tebufenozide (Mimic)	18	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, grapevines, 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
Two Spotted Mite (*Tetranychus urticae*) **Priority: Moderate**								
Rated as a moderate priority in QLD & NT, and as a low priority in NSW. Can cause similar damage as Banana Spider Mites but their incidence in damaging numbers is much less frequent. Severe outbreaks are usually associated with the use of cover sprays of broad-spectrum insecticides. Controlling dust and general plantation hygiene are important cultural controls. There are several predatory insects that feed on mite populations so limiting the use of disruptive insecticides will assist with biological control.								
Clofentezine (Apollo)	10A	IGR / Contact	NR	A	QLD, NSW & WA	Registered in bananas for control of **Two-Spotted Mite** and Strawberry Spider Mite. Apply when mites first appear. Apply a registered knockdown miticide for subsequent applications.	L Bee:L	-
Ethyl Formate (Vapormate)		Post-Harvest Fumigation	NR	A	ALL	Registered in bananas for post-harvest control of **Mites**, Mealybugs, Scale and Coffee Bean Weevil. Requires 6 hours of exposure in an enclosed chamber or box with a sealed plastic bag inside, at a temperature greater than 15 degrees Celsius. Users must be trained under a BOC approved training program.		-
Fenbutatin Oxide (Torque)	12A	Contact	1	A	QLD, NSW & NT	Registered in bananas for control of **Two-Spotted Mite** and Banana Spider Mite. Apply according to pest incidence, well before a dense infestation develops. Retreatment interval and maximum number of applications not specified.	L Bee:L	R2
Potassium Salts of Fatty Acid (Natrasoap)		Contact	NR	A	ALL	Soft option in fruit for control of aphids, thrips, mealybug, **spider mite** and whitefly. Use as a cover spray.	L Bee:L	-
Propargite (Omite)	12C	Contact	7	A	QLD, NSW, ACT & WA	Registered in bananas for control of **Two-Spotted Mite**. Spray when bunches covered and pests appear and repeat as necessary. Avoid spraying under hot-humid-slow drying conditions when young bananas may be susceptible to insecticide damage. Retreatment interval and maximum number of applications not specified.	M Bee:L	R3
Pyridaben (Sanmite)	21A	IGR / Contact	1	A	QLD, NSW, WA & NT	Registered in bananas for control of Strawberry Mite and **Two-Spotted Mite**. Apply when mite populations persist at a high level and damage to sensitive parts such as spearpoint suckers is evident. Retreatment interval and maximum number of applications not specified.	H Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Sulfur PER9409	UN	Contact	NR	A	NSW, QLD	Permitted in bananas for control of **mites**. Apply using duster shortly after bell emergence. Apply dust evenly to avoid heavy localised deposits which will result in unwanted visual residues of sulphur. Application is to be confined to fruit, avoiding leaves as much as possible as sulphur deposits will interfere with beneficial insect activity. Retreatment interval and maximum number of applications not specified.	M-H Bee:H	-
Bifenthrin (Talstar)	3A	Contact	1	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Banana Weevil Borer, Banana Rust Thrips and Strawberry Spider Mite.	VH Bee:H	R3
Etoxazole (Paramite)	10B	IGR / Contact	1	P-A	ALL	Registered in bananas for control of Strawberry Mite.	L Bee:VL	-
Beauveria bassiana (Velifer) BASF	UN	Ingestion		P		Biological currently registered in protected vegetables and ornamentals, with activity on mites.	L Bee:L	-
Bifenazate (Acramite) Arysta	20D	Contact & Ingestion		P		Registered for mite control in various crops.	L Bee:H	-
Cyflumetofen (Danisaraba) BASF	25A	Contact		P		Registered for control of various Mites in pome fruit, almonds, citrus, grapes, strawberries, fruiting vegetables and ornamentals.	L Bee:L	
Isocycloseram (Simodis) Syngenta	30	Ingestion		P		Registered for control of Diamond Back Moth, Cabbage White Butterfly and suppression of Heliothis in brassica vegetables and brassica leafy vegetables, suppression of Onion Thrips and Plague Thrips in bulb vegetables, control of Two Spotted Mite and Cucumber Moth and suppression of Broad Mite, Bean Red Spider Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in cucurbits, and control of Two Spotted Mite and Broad Mite and suppression of Tomato Russet Mite, Western Flower Thrips, Tomato Thrips, Melon Thrips, Plague Thrips and Heliothis in fruiting vegetables.	H Bee:VH	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
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	-
Burrowing Nematode (*Radopholus similis*) **Root-Knot Nematode** (*Meloidogyne* spp.) **Banana Spiral Nematode** (*Helicotylenchus multicinctus*) **Lesion Nematodes** (*Pratylenchus* spp.) **Priority: Moderate**								
Burrowing Nematode, Banana Spiral Nematode and Lesion Nematode are rated as moderate priority in QLD, and as a low priority in NSW & NT. Root-Knot Nematode is rated as a moderate priority in all states. Spiral Nematode is widespread in all banana producing areas and have recently been difficult to control with nematicides. Burrowing Nematode has been the most common and damaging nematode of bananas, although there has been a shift away from it being the dominant species in banana plantations. It is only found in east coast regions. The Root-Knot Nematode is widespread and abundant in all banana growing regions. The banana industry has been successful in reducing the need for nematicides used through crop rotation and soil health management. Modern nematicides don't reduce soil populations which has increased the need for an integrated approach to managing nematodes.								
Cadusafos (Rugby)	1B	Contact	14	A	NSW, WA, QLD	Registered in bananas for control of **Burrowing Nematode**, **Root-Knot Nematode**, **Spiral Nematode** and Banana Weevil Borer. Remove trash from base of stool and apply granules evenly to the soil surface in the area covered by a 30 cm radius around each stool. For best results apply just prior to irrigation or rainfall.	H Bee:H	-
Fenamiphos (Nemacur)	1B	Contact	NR	A	QLD, NSW & WA	Registered in banana planting material for control of Soil-Borne Plant Parasitic Nematodes. Remove all dead tissue from planting material and immerse unpaired pups in dip solution for 10 minutes.	H Bee:H	R3
Oxamyl (Vydate) Corteva	1A	Contact	NR NG	A	NSW, QLD, NT & WA	Registered in bananas for control of Banana Weevil Borer (*Cosmopolites sordidus*), **Burrowing Nematode** (*Radopholus similis*) and **Spiral Nematode** (*Heliocotylenchus* spp.) Apply by spotgun to moist soil that is free of trash and weeds. Commence application in early spring when visual root examination indicates nematodes are present. Apply at intervals of 3 months with 3 applications per season.	H Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Terbufos (Counter)	1B	Contact	NR	A	ALL	Registered in bananas for control of Banana Weevil Borer and **Burrowing Nematode**. Re-apply at 4 monthly intervals as required. Use a backpack granular applicator to apply to individual trees / followers or use a tractor granular applicator to apply a continuous band either side of the tree line.	H Bee:H	R3
Abamectin (Tervigo) Syngenta	6	Contact		P		Registered for control of **Root Knot Nematode** in fruiting vegetables, cucurbits, potato and sweet potato.	M Bee:H	-
Cyclobutrifluram (Tymirium)	N-3	Contact		P		Nematicide in development from Syngenta.	-	-
Fluazaindolizine (Salibro Reklemel) Corteva	N-UN	Contact		P	ALL	Registered in for control of Nematodes in cucurbits, fruiting vegetables, root & tuber vegetables and sweet potato.	-	-
Fluensulfone (Nimitz) Adama	N-UN	Contact		P	ALL	Registered for control of **Root Knot Nematode** in cucurbits, fruiting vegetables, carrots, potato, sweet potato and sugarcane.	-	-
Fluopyram (Velum Prime) Bayer	N-3	Contact		P		Hort Innovation is generating data to support registration for control of nematodes in strawberries. US registration for control of Nematodes in brassica leafy vegetables, bulb vegetables, cucurbits, fruiting vegetables, hops, legume vegetables, pome fruit, potato, sweet potato, small berries, sorghum, stone fruit, strawberries and other low-growing berries, sunflower, tobacco and tree nuts.	-	-
Banana Aphid (*Pentalonia nigronervosa*) **Priority: Low**								
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. Vector for BBTV. Banana Aphid is a minor and frequent pest in northern Qld where bunchy top does not occur. It is a more serious pest in south-east Qld because it is a vector of bunchy top disease. Chemical control of aphids is not effective for bunchy top control and direct damage is seldom severe enough to warrant treatment.								
Imidacloprid (Confidor Guard) + Paraffinic Oil PER14850	4A	Contact & Ingestion	NR	A	ALL	Permitted in bananas for control of Banana Aphid. Inject imidacloprid as a prepared solution into the pseudostem above the growing point. Apply paraffinic oil as a foliar spray. No fruit from treated plants under this permit can be sold or consumed.	M Bee:M	R2

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	Soft control option in fruit for control of **aphids**, thrips, mealybug, spider mite and whitefly. Use as a cover spray.	L Bee:L	-
Spirotetramat + Imidacloprid (Movento Energy) Bayer PER88359	23+4A	Contact & Ingestion	NR	A	QLD, NSW, NT & WA	Permitted in bananas for control of Banana Aphid. Do not use more than 1 application per crop. Do not treat plants after bell emergence. Do not inject into the centre of the plant to avoid plant death. Treatment can occur at any time within 3 months after harvest of the mother plant or nurse-suckering. Treat using a trunk injector. To limit the risk of plant damage, inject only those followers that are at least 1 m tall to the throat of the plant.	M Bee:M	R3
Afidopyropen (Versys) BASF	9D	Ingestion		P		Registered for control of various Aphids in sweet corn, rhubarb, artichoke, brassica vegetables, celery, cucurbits, fruiting vegetables, strawberry, leafy vegetables, brassica leafy vegetables, parsley, sweet potato, ginger and ornamentals.	L Bee:L	-
Beauveria bassiana (Velifer) BASF	UN	Biological		P		Biological currently registered in protected vegetables and ornamentals, with activity on Aphids.	L Bee:L	-
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Registered for suppression of various Aphids in fruiting vegetables, cucurbits, potatoes and strawberries.	L-M Bee:VH	-
Dimpropyridaz (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 various Aphids in apples, cucurbits, potatoes and 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. US registration for control of Aphids in tropical & subtropical fruit including bananas.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Pymetrozine (Chess) Syngenta	9B	Contact & Ingestion		P		Registered for control of Aphids in brassica vegetables, tomatoes, eggplant, capsicum, sweet corn, lettuce, endive, chicory, radicchio, leafy vegetables, cucurbits, potatoes, stone fruit, almonds, pistachios, beetroot, celery, cut flowers and nursery stock.	L Bee:VL	R3
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of various Aphids in green beans, brassica vegetables, brassica leafy vegetables, celery, rhubarb, cucurbits, fruiting vegetables, herbs, leafy vegetables, lettuce, chicory, endive, radicchio, potatoes, sweet potatoes, sweet corn, pome fruit and stone fruit.	M Bee:L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of various Aphids in cucurbits, fruiting vegetables, sweet corn, leafy vegetables, root & tuber vegetables, brassica vegetables, cane berries, strawberries, pome fruit, stone fruit, tree nuts, nursery stock and herbs.	M Bee:VH	-
Cane Grub / White Grub (*Lepidiota* spp.) **Priority: Low**								
Rated as a low priority in all states. Cane Grub larvae can cause damage to banana roots in early summer. This can lead to plant lodging under heavy pest pressure. Damage is similar to that caused by nematodes or Banana Weevil Borer. There are no chemical controls available, but it is likely that treatments for Banana Weevil Borer will keep Cane Grub in check.								
Bifenthrin (Talstar)	3A	Contact	1	P-A	Qld, NSW, WA, NT	Registered in bananas for control of Banana Weevil Borer, Banana Rust Thrips and Strawberry Spider Mite.	VH Bee:H	R3
Cadusafos (Rugby)	1B	Contact	14	P-A	Qld	Registered in bananas for control of Burrowing Nematode, Root-Knot Nematode, Spiral Nematode and Banana Weevil Borer.	H Bee:H	-
Banana-Silvering Thrips (*Hercinothrips bicinctus*) **Priority: Low**								
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. A minor and infrequent pest that causes minor superficial damage to the fruit. Control is not generally warranted.								
Potassium Salts of Fatty Acid (Natrasoap)		Contact	NR	A	ALL	Soft control option in fruit for control of aphids, **thrips**, mealybug, spider mite and whitefly. Use as a cover spray.	L Bee:L	

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Clothianidin (Shield) Sumitomo	4A	Contact	NR	P-A	ALL	Registered in bananas for control of Weevil Borer and Rust Thrips.	M Bee:VH	R2
Fipronil (Regent)	2B	Contact & Ingestion	NR	P-A	QLD, NSW, WA & NT	Registered in bananas for control of Banana Rust Thrips and Banana Weevil Borer.	M Bee:VH	R3
Imidacloprid (Confidor Guard)	4A	Contact & Ingestion	NR	P-A	NTH QLD, NT, NTH WA	Registered in bananas for control of Banana Rust Thrips and Banana Weevil Borer.	M Bee:M	R2
Spinetoram (Success Neo) Corteva	5	Contact & Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Rust Thrips and Sugarcane Bud Moth.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Contact & Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Rust Thrips and Sugarcane Bud Moth.	L Bee:H	-
Spirotetramat + Imidacloprid (Movento Energy) Bayer	23+4A	Contact & Ingestion	NR	P-A	QLD, NSW, NT & WA	Registered in bananas for control of Banana Rust Thrips and Banana Weevil Borer.	M Bee:M	R3
Cyantraniliprole (Benevia) FMC	28	Ingestion		P		Registered for suppression of various Thrips in bulb vegetables, fruiting vegetables, cucurbits, potatoes and strawberries.	L-M Bee:VH	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. US registration for control of various Thrips in berries, citrus, fruiting vegetables and tropical & subtropical fruit.	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	-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of various Thrips in green beans, celery, rhubarb, fruiting vegetables, herbs, lettuce, bulb onions, bulb vegetables, citrus and grapes.	M Bee:L	-
Banana Fruit Caterpillar (*Tiracola plagiata*) **Priority: Low**								
Rated as a low priority in all states. Minor and sporadic pest, Banana Fruit Caterpillar are only ever a problem in South-East Qld. They usually only attack bunches on the edges of a plantation. They can cause substantial fruit damage because of their size. Loss of access to key products may lead to this pest increasing in significance.								
Chlorpyrifos (Lorsban)	1B	Contact	14	A	QLD, NSW	Registered in bananas for control of Banana Scab Moth, Banana Weevil Borer and **Caterpillars**. Apply as a cover spray from the first appearance of flower bell and repeat as populations indicate until fingers are exposed. Burning of young fruit may occur under poor drying conditions. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorpyrifos (Lorsban) PER14240	1B	Contact	14	A	NSW, QLD, NT & WA	Permitted in bananas for control of Sugar Cane Bud Moth, Banana Scab Moth, Banana Rust Thrips, Mealybugs and **caterpillars**. Apply as a dust to the inside of the bunch cover and the fruit. Mix product with a talc and ensure dusting occurs within 1 week of bunch covering. Maximum of one application per season. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Bacillus thuringiensis (DiPel DF)	11	Biological	NR	P-A	ALL	Registered in fruit for control of susceptible lepidopteran larvae.	VL Bee:L	-
Spinetoram (Success Neo) Corteva	5	Contact & Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Rust Thrips and Sugarcane Bud Moth.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Contact & Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Rust Thrips and Sugarcane Bud Moth.	L Bee:H	-
Tetraniliprole (Vayego Forte) Bayer	28	Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Weevil Borer.	L-M Bee:L	-
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potatoes), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, 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, Rubus spp., pome fruit, stone fruit, strawberries, grapes and macadamias.	L 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	-
Methoxyfenozide (Prodigy)	18	Ingestion		P		Registered for control of various lepidopteran pests in almonds, pome fruit, avocado, blueberry, citrus, coffee, custard apple, grapevines, kiwifruit, longan, lychee, macadamia and fruiting vegetables.	VL Bee:VL	-
Tebufenozide (Mimic)	18	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, grapevines, kiwifruit, longan, lychee and macadamia.	L Bee:L	-
Cluster Caterpillar (*Spodoptera litura*) **Priority: Low**								
Rated as a low priority in QLD & NSW, and as a moderate priority in NT. Minor and infrequent pest that mostly attacks the leaves of the plant and not the fruit. Control is not generally warranted, although loss of access to key products may lead to this pest increasing in significance.								
Chlorpyrifos (Lorsban)	1B	Contact	14	A	QLD, NSW	Registered in bananas for control of Banana Scab Moth, Banana Weevil Borer and **Caterpillars**. Apply as a cover spray from the first appearance of flower bell and repeat as populations indicate until fingers are exposed. Burning of young fruit may occur under poor drying conditions. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorpyrifos (Lorsban) PER14240	1B	Contact	14	A	NSW, QLD, NT & WA	Permitted in bananas for control of Sugar Cane Bud Moth, Banana Scab Moth, Banana Rust Thrips, Mealybugs and **caterpillars**. Apply as a dust to the inside of the bunch cover and the fruit. Mix product with a talc and ensure dusting occurs within 1 week of bunch covering. Maximum of one application per season. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Bacillus thuringiensis (DiPel DF)	11	Biological	NR	P-A	ALL	Registered in fruit for control of susceptible lepidopteran larvae.	VL Bee:L	-
Spinetoram (Success Neo) Corteva	5	Contact & Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Rust Thrips and Sugarcane Bud Moth.	M Bee:VH	-
Spinosad (Entrust Organic) Corteva	5	Contact & Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Rust Thrips and Sugarcane Bud Moth.	L Bee:H	-
Tetraniliprole (Vayego Forte) Bayer	28	Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Weevil Borer.	L-M Bee:L	-
Amorphous Silica (Abrade)	-	Contact		P		Registered for control of various caterpillar pests in cotton, brassica vegetables, capsicums, canola and mustard.	-	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potatoes), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, 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, Rubus spp., pome fruit, stone fruit, strawberries, grapes and macadamias.	L 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	-
Methoxyfenozide (Prodigy)	18	Ingestion		P		Registered for control of various lepidopteran pests in almonds, pome fruit, avocado, blueberry, citrus, coffee, custard apple, grapevines, kiwifruit, longan, lychee, macadamia and fruiting vegetables.	VL Bee:VL	-
Tebufenozide (Mimic)	18	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, grapevines, kiwifruit, longan, lychee and macadamia.	L Bee:L	-
Queensland Fruit Fly (*Bactrocera tryoni*) **Oriental Fruit Fly** (*Bactrocera dorsalis*) **Priority: Low**								
Rated as a low priority in all states. Queensland Fruit Fly is a pest of a wide range of horticultural crops in Qld, but only rarely damages banana. In-crop control measures are unlikely to be required. Post-harvest treatments may be required for fruit sent interstate or exported. Non-Cavendish varieties are unable to meet ICA criteria and limiting export to certain states due to lack of registered control options.								
Dimethoate PER13859	1B	Contact	NR	A	ALL	Permitted in non-bearing fruit fly host crops for control of **Fruit Fly**. Apply as a foliar and/or ground cover spray to both fallen and retained fruit after final harvest. Do not use more than 2 applications per season.	H Bee:H	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Spinosad (Naturalure) Corteva	5	Bait / Ingestion	NR	A	ALL	Registered in tree crops for control of Fruit Flies including **Queensland Fruit Fly** and Mediterranean Fruit Fly. Apply as either a band or a spot spray to the lower canopy of fruiting plants. Begin applications as soon as monitoring traps indicate flies are present and fruit is at a susceptible stage. Repeat applications every 7 days, re-applying sooner if rain washes off the deposit. Avoid spraying the fruit as phytotoxicity may occur.	L Bee:H	-
Trichlorfon (Lepidex) PER12450	1B	Contact	7 G:7	A	ALL (excl. VIC)	Permitted in bananas for control of **Queensland Fruit Fly** and Mediterranean Fruit Fly. Apply as a cover spray. Repeat at half concentration every 7-10 days. Apply a maximum of 4 applications per season.	H Bee:H	R2
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion / IGR		P		Registered for suppression of **Queensland Fruit Fly** in avocados, citrus and mangoes.	M Bee:H	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Hort Innovation 2021/22 AgVet Grant (ST21001) to undertake studies to support a label registration for the control of **Fruit Fly** in stone fruit. Registered in macadamias for control of Fruit Spotting Bugs, Lace Bug and Scirtothrips. US registration for control of Aphids, Blueberry Thrips and Blueberry Maggot in bushberries.	L Bee:L	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Mealy Bugs (*Pseudococcus jackbeardsleyi*) **Priority: Low**								
Rated as a low priority in all states. Minor and infrequent pest, although loss of access to key products may lead to this pest increasing in significance.								
Chlorpyrifos (Lorsban) PER14240	1B	Contact	14	A	NSW, QLD, NT & WA	Permitted in bananas for control of Sugar Cane Bud Moth, Banana Scab Moth, Banana Rust Thrips, **Mealybugs** and caterpillars. Apply as a dust to the inside of the bunch cover and the fruit. Mix product with a talc and ensure dusting occurs within 1 week of bunch covering. Maximum of one application per season. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Ethyl Formate (Vapormate)		Post-Harvest Fumigation	NR	A	ALL	Registered for post-harvest control of Mites, **Mealybugs**, Scale and Coffee Bean Weevil in banana. Requires 6 hours of exposure in an enclosed chamber or box with a sealed plastic bag inside, at a temperature greater than 15 degrees Celsius. Users must be trained under a BOC approved training program.		-
Potassium Salts of Fatty Acid (Natrasoap)		Contact	NR	A	ALL	Soft option in fruit for control of aphids, thrips, **mealybug**, spider mite and whitefly. Use as a cover spray.	L Bee:L	-
Clothianidin (Shield) Sumitomo	4A	Contact	NR	P-A	ALL	Registered in bananas for control of Weevil Borer and Rust Thrips. Registered for control of **Mealybug** in apples, pears, table grapes and wine grapes.	M Bee:VH	R2
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion		P		Registered for control of Longtailed Mealybug in apples and pears.	M Bee:M	R2

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion		P		Registered for control of **Mealybugs** in citrus, grapevines and macadamias.	M Bee:M	R2
Buprofezin (Applaud)	16	Ingestion		P		Registered for control of **Mealybugs** in citrus, grapes and pears.	L Bee:L	-
Flonicamid (Mainman) UPL	29	Ingestion		P		Registered for control of **Mealybug** in apples and pears.	M Bee:VL	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of various sucking pests in macadamias, avocados, mangoes, papaya, cucurbits, eggplant, peppers, tomatoes, green beans, potatoes and sweet potatoes. US registration for control of **Mealybug** in citrus and small fruit vine climbing (except Fuzzy Kiwifruit).	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of **Mealybugs** in citrus, grapes, mangoes, passionfruit, pineapples, pome fruit and stone fruit.	M Bee:VL	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of **Mealybugs** in carob, citrus, custard apple, grapes, lychee, papaya, passionfruit, persimmon, pineapple, pome fruit and nursery stock.	M Bee:H	-
Scale (Coccidae) **Priority: Low**								
Rated as a low priority in all states. Minor pest and control measures are rarely warranted.								
Ethyl Formate (Vapormate)		Post-Harvest Fumigation	NR	A	ALL	Registered in bananas for post-harvest control of Mites, Mealybugs, **Scale** and Coffee Bean Weevil. Requires 6 hours of exposure in an enclosed chamber or box with a sealed plastic bag inside, at a temperature greater than 15 degrees Celsius. Users must be trained under a BOC approved training program.	-	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Petroleum Oil		Contact	1	A	QLD, NSW, WA	Registered in bananas for control of **Scale Insects**. Apply when heavy scale populations occur on stem, foliage or fruit. Do not apply if trees need watering. Application is most effective against young crawler stages. Treatments per season not limited.	L Bee:L	-
Clothianidin (Shield) Sumitomo	4A	Contact	NR	P-A	ALL	Registered in bananas for control of Weevil Borer and Rust Thrips. Registered for control of **Mealybug** in apples, pears, table grapes and wine grapes.	M Bee:VH	R2
Acetamiprid + Novaluron (Cormoran) Adama	4A+15	Contact & Ingestion		P		Registered for control of San Jose Scale in apples, pears and stone fruit.	M Bee:M	R2
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion		P		Registered for control of various species of **Scale** in avocados, citrus, grapevines, macadamias and mangoes.	M Bee:M	R2
Buprofezin (Applaud)	16	Ingestion		P		Registered for control of various species of **Scale** in citrus, custard apples, grapes, mangoes, passionfruit and persimmons.	L Bee:L	-
Fenoxycarb (Insegar) Syngenta	7B	Contact & Ingestion		P		Registered for control of **Scale** in apples, pears and olives.	L Bee:VL	-
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of various sucking pests in macadamias, avocados, mangoes, papaya, cucurbits, eggplant, peppers, tomatoes, green beans, potatoes and sweet potatoes. US registration for control of **Scale Insects** in citrus, pome fruit and stone fruit.	L Bee:L	-
Spirotetramat (Movento) Bayer	23	Ingestion		P		Registered for control of various species of **Scale** in blueberries, citrus, grapes, mangoes, passionfruit, pome fruit and stone fruit.	M Bee:VL	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of various species of **Scale** in cane berries, citrus, lychee, mango, papaya, passionfruit, persimmon, pome fruit and nursery stock.	M Bee:H	-

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Banana Spotting Bug (*Amblypelta lutescens*) **Fruit Spotting Bug** (*Amblypelta nitida*) **Priority: Low**								
Rated as a low priority in all states. No chemical controls available. Bananas are not preferred host for spotting bugs, but they will damage fruit if there are no other crops in the vicinity. They may cause small fruit to shed and in larger fruit they cause superficial dimples on the surface, similar to that caused by Fruit Fly. No chemical options are registered but broad spectrum insecticides would provide incidental control.								
Acetamiprid + Pyriproxyfen (Trivor) Adama	4A+7C	Contact & Ingestion		P		Registered for control of **Fruit Spotting Bug**s in avocados, citrus, macadamias and mangoes.	M Bee:M	R2
Flupyradifurone (Sivanto Prime) Bayer	4D	Contact & Ingestion		P		Registered for control of **Fruit Spotting Bug**s in macadamias, avocados, mangoes and papaya.	L Bee:L	-
Sulfoxaflor (Transform) Corteva	4C	Contact & Ingestion		P		Registered for control of **Fruit Spotting Bugs** in tropical & subtropical fruit (except bananas and pineapple), citrus, macadamia and persimmon.	M Bee:H	-
Fruit Piercing Moth (*Eudocima* spp.) **Priority: Low**								
Rated as a low priority in all states. Infrequent pest and control measures are rarely warranted.								
Chlorpyrifos (Lorsban)	1B	Contact	14	A	QLD, NSW	Registered in bananas for control of Banana Scab Moth, Banana Weevil Borer and **Caterpillars**. Apply as a cover spray from the first appearance of flower bell and repeat as populations indicate until fingers are exposed. Burning of young fruit may occur under poor drying conditions. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Chlorpyrifos (Lorsban) PER14240	1B	Contact	14	A	NSW, QLD, NT & WA	Permitted in bananas for control of Sugar Cane Bud Moth, Banana Scab Moth, Banana Rust Thrips, Mealybugs and **caterpillars**. Apply as a dust to the inside of the bunch cover and the fruit. Mix product with a talc and ensure dusting occurs within 1 week of bunch covering. Maximum of one application per season. NOTE: The APVMA has published its proposed decision for reconsideration of label uses for chlorpyrifos. They are still receiving submissions but at this stage they are not supporting the continued use of chlorpyrifos in bananas.	H Bee:H	R1
Bacillus thuringiensis (DiPel DF)	11	Biological	NR	P-A	ALL	Registered in fruit for control of susceptible lepidopteran larvae.	VL Bee:L	-
Spinetoram (Success Neo) Corteva PER87198	5	Contact & Ingestion	NR	P-A	NSW, NT, QLD & WA	Permitted in bananas for control of Banana Rust Thrips, Banana Flower Thrips and Flower Eating Caterpillars such as Sugarcane Bud Moth and Scab Moth.	M Bee:VH	-
Tetraniliprole (Vayego Forte) Bayer	28	Ingestion	NR	P-A	ALL	Registered in bananas for control of Banana Weevil Borer.	L-M Bee:L	-
Emamectin (Proclaim Opti) Syngenta	6	Ingestion		P		Registered for control of various lepidopteran pests in brassica vegetables, root & tuber vegetables (except potatoes), leafy vegetables, brassica leafy vegetables, sweet corn, strawberries, lettuce, 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, Rubus spp., pome fruit, stone fruit, strawberries, grapes and macadamias.	L 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	-
Methoxyfenozide (Prodigy)	18	Ingestion		P		Registered for control of various lepidopteran pests in almonds, pome fruit, avocado, blueberry, citrus, coffee, custard apple, grapevines, kiwifruit, longan, lychee, macadamia and fruiting vegetables.	VL Bee:VL	-
Tebufenozide (Mimic)	18	Ingestion		P		Registered for control of various lepidopteran pests in apples, pears, avocado, citrus, custard apple, grapevines, kiwifruit, longan, lychee and macadamia.	L Bee:L	-
Reniform Nematode (*Rotylenchulus reniformis*) **Priority: Low**								
Rated as a low priority in all states. The Reniform Nematode is a minor pest in bananas and is not thought to be present in growing regions outside of North Qld.								
Fenamiphos (Nemacur)	1B	Contact	NR	A	QLD, NSW & WA	Registered in banana planting material for control of Soil-Borne Plant Parasitic Nematodes. Remove all dead tissue from planting material and immerse unpaired pups in dip solution for 10 minutes.	H Bee:H	R3
Cadusafos (Rugby)	1B	Contact	14	P-A	NSW, WA, QLD	Registered in bananas for control of Burrowing Nematode, Root-Knot Nematode, Spiral Nematode and Banana Weevil Borer.	H Bee:H	-
Oxamyl (Vydate) Corteva	1A	Contact	NR NG	P-A	NSW, QLD, NT & WA	Registered in bananas for control of Banana Weevil Borer (*Cosmopolites sordidus*), Burrowing Nematode (*Radopholus similis*) and Spiral Nematode (*Heliocotylenchus* spp.)	H Bee:H	-
Terbufos (Counter)	1B	Contact	NR	P-A	ALL	Registered in bananas for control of Banana Weevil Borer and Burrowing Nematode.	H Bee:H	R3

Pest / Active Ingredient (Trade Name)	Chemical group	Activity	WHP, days	Availability	States	Comments	Impact on beneficials	Regulatory risk
Abamectin (Tervigo) Syngenta	6	Contact		P		Registered for control of Root Knot Nematode in fruiting vegetables, cucurbits, potato and sweet potato.	M Bee:H	-
Cyclobutrifluram (Tymirium)	N-3	Contact		P		Nematicide in development from Syngenta.	-	-
Fluazaindolizine (Salibro Reklemel) Corteva	N-UN	Contact		P	ALL	Registered in for control of Nematodes in cucurbits, fruiting vegetables, root & tuber vegetables and sweet potato.	-	-
Fluensulfone (Nimitz) Adama	N-UN	Contact		P	ALL	Registered for control of Root Knot Nematode in cucurbits, fruiting vegetables, carrots, potato, sweet potato and sugarcane.	-	-
Fluopyram (Velum Prime) Bayer	N-3	Contact		P		Hort Innovation is generating data to support registration for control of nematodes in strawberries. US registration for control of Nematodes in brassica leafy vegetables, bulb vegetables, cucurbits, fruiting vegetables, hops, legume vegetables, pome fruit, potato, sweet potato, small berries, sorghum, stone fruit, strawberries and other low-growing berries, sunflower, tobacco and tree nuts.	-	-

4.3 Weeds of Bananas

4.3.1 Weed priorities

Weeds	Priority
Navua Sedge (*Cyperus* spp.)	M
Nutgrass (*Cyperus rotundus*)	M
Feathertop Rhodes Grass (*Chloris virgata*)	L
Barnyard Grass (*Echinochloa colona*)	L
Liverseed Grass (*Eurochloa* spp.)	L
Johnson Grass (*Sorghum halepense*)	L
Pigweed (*Portulaca* spp.)	L
Sowthistle (*Sonchus oleraceus*)	L
Caltrop (*Tribulus terrestris*)	L
Blackberry Nightshade (*Solanum nigrum*)	L
Silverleaf Nightshade (*Solanum elaeagnifolium*)	L
Bellvine (*Ipomoea plebeia*)	L
Shepherd's Purse (*Capsella bursapastoris*)	L
Slender Celery (*Apium leptophyllum*)	L
Marshmallow (*Malva parviflora*)	L
Stagger Weed (*Stachys arvensis*)	L
Spiny Emex (*Emex australis*)	L
Liverseed Grass (*Urochloa panicoides*)	L
Couch Grass (*Cynodon dactylon*)	L
Paspalum (*Paspalum dilatatum*)	L
Crowsfoot Grass (*Eleusine indica*)	L
Ryegrass (*Lolium* spp.)	L
Flaxleaf Fleabane (*Conyza bonariensis*)	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 Navua Sedge and Nutgrass as moderate 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 22[7].

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

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.

4.3.2 Available and potential products for weed control

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

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

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Navua Sedge (*Cyperus* spp.) **Priority: Moderate**							
Rated as a moderate priority in QLD & NSW, and as a low priority in NT. Navua Sedge is a vigorous perennial sedge with a continuously growing underground stem. It flourishes in damp, low-lying areas and is difficult to control with herbicides alone.							
Glyphosate (Roundup)	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Cyhalofop-Butyl + Florpyrauxifen-Benzyl (Agixa Rinskor) Corteva	1*** + 4**		Registered for control of **Navua Sedge** in rice.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
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 *Cyperus* species in bulb onions.		P		-
Florpyrauxifen-Benzyl (Ubeniq Rinskor) Corteva	4**		Registered for control of **Navua Sedge** in tropical grass pastures.		P		-
Halosulfuron-Methyl (Sempra)	2***		Registered for control of **Navua Sedge** in pastures.		P		-
Norflurazon (Zoliar) AgNova	12**		Registered for control of Nutgrass in asparagus.		P		-
Nutgrass (*Cyperus rotundus*) **Priority: Moderate**							
Rated as a moderate priority in all states. 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 (Roundup)	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
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 *Cyperus* species in bulb onions.		P		-
Halosulfuron-Methyl (Sempra)	2***		Registered for control of **Nutgrass** in turf and sugarcane.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Norflurazon (Zoliar) AgNova	12**		Registered for control of **Nutgrass** in asparagus.		P		-
Feathertop Rhodes Grass (*Chloris virgata*) **Priority: Low**							
Rated as a low priority in QLD, and as a moderate priority in NSW & NT. Feathertop Rhodes Grass is an aggressive grass weed that is difficult to control with herbicides. Multiple herbicide applications are required.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Flumioxazin (Chateau)	14**		Registered for control of **Feather Top Rhodes Grass** in grapevines, pome fruit, stone fruit, citrus, tree nuts, olives, avocados and blueberries.		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
Barnyard Grass (*Echinochloa colona*) **Priority: Low**							
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. 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.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Diuron	5**	Bananas / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed spray as a tank mix with paraquat.	NR	A	NSW, QLD & WA	R3
Fluazifop – P (Fusilade)	1***	Banana / directed spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	NSW, QLD, NT & WA	-
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Oryzalin	3**	Banana / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H:NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Banana / Directed Spray, Requires Incorporation	Registered in bananas for control of grass & broadleaf weeds. 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	-
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		-
Liverseed Grass (*Eurochloa* spp.) **Priority: Low**							
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. Liverseed Grass is a common, summer-growing annual grass weed.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-
Johnson Grass (*Sorghum halepense*) **Priority: Low**							
Rated as a low priority in all states. Johnson Grass is a large, summer growing perennial that is difficult to eradicate with herbicides.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Fluazifop – P (Fusilade)	1***	Banana / directed spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	NSW, QLD, NT & WA	-
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Pigweed (*Portulaca* spp.) **Priority: Low**							
Rated as a low priority in QLD & NSW, and as a moderate priority in NT. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Diuron	5**	Bananas / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed spray as a tank mix with paraquat.	NR	A	NSW, QLD & WA	R3
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Oryzalin	3**	Banana / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H:NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Banana / Directed Spray, Requires Incorporation	Registered in bananas for control of grass & broadleaf weeds. 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	-
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		-
Sowthistle (*Sonchus oleraceus*) **Priority: Low**							
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Diuron	5**	Bananas / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed spray as a tank mix with paraquat.	NR	A	NSW, QLD & WA	R3
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H: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**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Oryzalin	3**	Banana / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H:NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Banana / Directed Spray, Requires Incorporation	Registered in bananas for control of grass & broadleaf weeds. 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	-
Isoxaben (Gallery) Corteva	29**		Registered for control of **Sowthistle** in non-crop, forests, fencelines, tree fruit & nut orchards, vineyards, nursery & amenity tree plantings.		P		-
Napropamide (Devrinol)	0**		Registered for control of **Sowthistle** in almonds, grapevines, stone fruit, tomatoes and canola.		P		-
Nonanoic Acid (Beloukha)	-		Registered for control of **Sowthistle** in non-crop areas, turf, orchards & vineyards, fallow and forestry.		P		-
Norflurazon (Zoliar) Agnova	12**		Registered for control of grass and broadleaf weeds including **Sowthistle** in citrus, grapes, almonds, stone & pome fruits.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Saflufenacil (Sharpen) BASF	14**		Registered for control of grass and broadleaf weeds, including **Sowthistle** in cereal crops.		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		-
Caltrop (*Tribulus terrestris*) **Priority: Low**							
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Oryzalin	3**	Banana / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-
Blackberry Nightshade (*Solanum nigrum*) **Silverleaf Nightshade** (*Solanum elaeagnifolium*) **Priority: Low**							
Rated as a low priority in all states. 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.							
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Oryzalin	3**	Banana / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H:NR G:7	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 in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-
Bellvine (*Ipomoea plebeia*) **Priority: Moderate**							
Rated as a low priority in all states. Bellvine is an invasive and fast-growing annual broadleaf weed that can be difficult to remove once it is established.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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
Shepherd's Purse (*Capsella bursapastoris*) **Priority: Low**							
Rated as a low priority in all states. Shepherd's Purse is an erect, annual broadleaf which is adapted to a wide range of environments. Herbicide options are limited.							
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-
Slender Celery (*Apium leptophyllum*) **Priority: Low**							
Rated as a low priority in all states. Slender Celery is a widespread annual broadleaf. Herbicide options are limited.							
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-
Marshmallow (*Malva parviflora*) **Priority: Low**							
Rated as a low priority in all states. Marshmallow is adapted to a wide variety of environments and highly competitive weed. Control with knockdown herbicides can be unreliable.							
Carfentrazone	14**	Tropical & Sub-Tropical Fruit / Directed spray	Registered in tropical & sub-tropical fruit for control of broadleaf weeds. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Tropical & Sub-Tropical Fruit	Registered in tropical & sub-tropical fruit for control of broadleaf weeds. Apply as a directed spray or spot spray.	NR G:14	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H:NR G:7	A	ALL	R3
Fluroxypyr (Starane) Corteva	4**		Registered for control of **Small Flowered Mallow** in fallows.		P		-
Isoxaben (Gallery) Corteva	29**		Registered for control of **Small Flowered Mallow** in non-crop, forests, fencelines, tree fruit & nut orchards, vineyards, nursery & amenity tree plantings and pyrethrum.		P		-
Stagger Weed (*Stachys arvensis*) **Priority: Low**							
Rated as a low priority in all states. Stagger Weed is a widespread annual broadleaf. Herbicide options are limited.							
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-
Spiny Emex (*Emex australis*) **Priority: Low**							
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. Spiny Emex is a vigorous annual with a thick taproot and fruits with distinctive clusters of spines.							
Carfentrazone	14**	Tropical & Sub-Tropical Fruit / Directed spray	Registered in tropical & sub-tropical fruit for control of broadleaf weeds. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Tropical & Sub-Tropical Fruit	Registered in tropical & sub-tropical fruit for control of broadleaf weeds. Apply as a directed spray or spot spray.	NR G:14	A	ALL	R3
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-
Liverseed Grass (*Eurochloa* spp.) **Priority: Low**							
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. Liverseed Grass is a common, summer-growing annual grass weed.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-
Couch Grass (*Cynodon dactylon*) **Priority: Low**							
Rated as a low priority in QLD & NT, and as a moderate priority in NSW. 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.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
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		-
Paspalum (*Paspalum dilatatum*) **Priority: Low**							
Rated as a low priority in all states. Paspalum is an aggressive perennial grass weed that is widespread across a range of conditions.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
S-Metolachlor (Dual Gold) Syngenta	15**		Registered for control of grass and broadleaf weeds in Brassica vegetables, Brassica leafy vegetables, sweet potatoes, spring onions, shallots, spinach, silverbeet, rhubarb, culinary herbs and beans.		P		-

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Crowsfoot Grass (*Dactyloctenium aegyptium*) **Priority: Low**							
Rated as a low priority in QLD, and as a moderate priority in NSW & NT. Crowsfoot Grass is a summer-growing, annual grass that is difficult to control with herbicides and tolerates low mowing heights.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Diuron	5**	Bananas / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed spray as a tank mix with paraquat.	NR	A	NSW, QLD & WA	R3
Fluazifop – P (Fusilade)	1***	Banana / directed spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	NSW, QLD, NT & WA	-
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H:NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Banana / Directed Spray, Requires Incorporation	Registered in bananas for control of grass & broadleaf weeds. 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	-
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		-
Ryegrass (*Lolium* spp.) **Priority: Low**							
Rated as a low priority in all states. Ryegrass is an aggressive annual grass that is widespread and is prone to development of herbicide resistance.							
2,2-DPA	0**	Bananas / Directed Spray	Registered in bananas as a directed spray for control of annual and perennial grasses. Apply as a directed spray.	7	A	NSW, QLD	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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
Diuron	5**	Bananas / Directed Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed spray as a tank mix with paraquat.	NR	A	NSW, QLD & WA	R3
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H: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**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Registered in bananas for control of grass weeds. Apply as a directed spray.	NR	A	ALL	-
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H:NR G:7	A	ALL	R3
Pendimethalin (Stomp)	3**	Banana / Directed Spray, Requires Incorporation	Registered in bananas for control of grass & broadleaf weeds. 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	-
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		-
Flaxleaf Fleabane (*Conyza bonariensis*) **Priority: Low**							
Rated as a low priority in all states. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. 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**	Banana / Directed or Shielded Spray	Registered in bananas for control of grass & broadleaf weeds. Apply as a directed or shielded spray.	H:NR G:56	A	ALL	R3
Glyphosate	9**	Tropical & Subtropical Fruit / Directed Spray, Shielded Spray or Wick Wiper	Registered in tropical & subtropical fruit for control of various grass and broadleaf weeds. Do not allow spray to contact any part of the tree, including the trunk.	NR	A	ALL	R3
Paraquat (Gramoxone)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	1 G:7	A	ALL	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Registered in bananas 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.	H: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		-

4.4 Plant Growth Regulators in Bananas

4.4.1 Plant Growth Regulator Priorities

PGR Issue	Priority
Crop timing	H
Sucker control	H
Plant destruction	H

Plant Growth Regulators (PGRs) play a limited but important role in managing banana plantations. PGRs play a role in crop timing, sucker control and plant destruction as part of the strategy to manage Panama Disease. Ethephon has been used for many years to advance crop ripening and has been shown to impact on fruit size and quality parameters. The use of 2,4-D is commonplace to control suckers and maintain the desired plant conformation.

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
Crop timing **Priority: High**							
Crop timing management involves the advancement of ripening. This can lead to increased fruit size and better fruit quality.							
Ethephon PER14966	PGR	Bananas	Permitted in bananas for crop timing management. Apply as an injection to the pseudostem. Treat plants in the height range 2 to 3 metres with good growth. Completely remove the leaf canopy of injected plants at the time of treatment, or within 5 days of treatment. Use one treatment per season only.	NR	A	QLD	-
Sucker control **Priority: High**							
The advantage of sucker control is that it enables a more favourable plant confirmation and promotes uniform ripening and fruit quality.							
2,4-D	4**	Cavendish Bananas / Stem Injection / Sucker Destruction	Registered in Cavendish bananas for control of suckers. Apply by stem injection.	NR	A	QLD	R3

Active ingredient (Trade Name)	Chemical Group	Crop/ Situation	Comment / Use / Weed	WHP (days)	Availability	States	Regulatory risk
Diesel Distillate PER14237		Bananas / Cut Stump or Injection	Permitted in bananas for control of suckers. Cut suckers at ground level and treat cut with undiluted diesel or inject undiluted diesel at the growing point of the sucker.	NR	A	NSW, QLD, WA & NT	-
Plant destruction **Priority: High**							
Plant destruction is required as part of the biosecurity response for Panama Disease. A minor use permit is in place for the use of glyphosate in this situation.							
Glyphosate (Roundup) PER14850	9	Banana / Injection	Permitted in bananas for destruction of banana plants. Inject mixture into pseudostem above the growing point.	NH NG	A	ALL	R3

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

Appendix 1. Products available for disease control in bananas

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
Bacillus amyloliquefaciens Strain QST 713 (Serenade Prime Soil Ameliorant and Biofungicide) Bayer	BM01	Bananas	Yellow Sigatoka *(Mycosphaerella musicola)* Common Leaf Speckle *(Mycosphaerella musae)* (Suppression only)	ALL	NR	-
Benzalkonium Chloride, Didecyldimethyl Ammonium Chloride PER86485		Sanitising and Decontamination of Agricultural Surfaces and Equipment	Panama Disease (Race 4) *(Fusarium oxysporum f. sp. Cubense)*	ALL	NR	-
Bromo Chloro Dimethyl Hydatoin (BCDMH)		Sanitiser / Post-Harvest Treatment	External Rot Causing Organisms	ALL	NR	-
Chlorine		Sanitiser / Post-Harvest Treatment	Bacteria and Fungi	ALL	NR	-
Chlorothalonil (Bravo)	M5	Bananas	Leaf Spot *(Mycosphaerella musicola)* Leaf Speckle (*Mycosphaerella musae*)	QLD, NSW, NT & WA	1	R3
Copper (Cu) as copper ammonium complex	M1	Bananas	Yellow Sigatoka *(Mycosphaerella musicola)*	QLD, NSW, WA & NT	1	-
			Phytophthora Stem Canker	NSW, WA		
Copper (Cu) present as copper oxychloride	M1	Bananas	Cercospora Leaf Spot *(Cercospora musae)*	NSW, QLD & WA	1	-
Copper (Cu) present as cupric hydroxide	M1	Bananas	Cercospora Leaf Spot	QLD, NSW & WA	1	-
			Phytophthora Stem Canker	NSW, WA		
Copper (Cu) present as tribasic copper sulfate	M1	Bananas	Cercospora Leaf Spot	QLD, NSW & WA	1	-

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
			Phytophthora Stem Canker	ALL		
Didecyl Dimethyl Ammonium Chloride (Steri-Max Biocide)		Bananas / Sanitation & Water Treatment	*Fusarium oxysporum f. sp. cubense* (Rac1, Foc)	ALL	NR	-
Difenoconazole (Score)	3	Bananas	Yellow Sigatoka *(Mycosphaerella musicola)* Black Sigatoka *(Mycosphaerella fijiensis)*	QLD, NSW & NT	1	R3
Epoxiconazole (Opus)	3	Bananas / bagged	Leaf Spot /Yellow Sigatoka *(Mycosphaerella musicola)* Leaf Speckle *(Mycosphaerella musae)*	ALL	1	R3
Fluopyram (Luna Privilege) Bayer	7	Bananas	Yellow Sigatoka Leaf Speckle Cordana Leaf Spot	QLD, NSW, WA & NT	NR	-
Fluopyram + Tebuconazole (Luna Experience) Bayer	7 + 3	Bananas	Yellow Sigatoka *(Mycosphaerella musicola)* Leaf Speckle *(Mycosphaerella musae)* Cordana Leaf Spot *(Cordana musae)*	ALL	1	R3
Fluxapyroxad (Sercadis) BASF	7	Bananas	Yellow Sigatoka *(Mycosphaerella musicola)* Leaf Speckle *(Mycosphaerella musae)*	ALL	NR	-
Glyphosate (Roundup) PER92657	9	Banana	Banana Freckle (*Phyllosticta cavendishii*)	NT	NR NG	R3
Inpyrfluxam (Excalia) Sumitomo	7	Banana	Yellow Sigatoka	ALL	1	-
Iodine		Tropical & Subtropical Fruit / Post-Harvest Sanitiser	Bacteria & Fungi	ALL	NR	-

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
Isotianil (Routine) Bayer	PO3	Bananas	Yellow Sigatoka *(Mycosphaerella musicola)* Common Leaf Speckle *(Mycosphaerella musae)*	QLD, NSW, WA & NT	NR	-
Mancozeb	M3	Bananas	Leaf Spot *(Mycosphaerella musicola)* Black Pit Cordana Leaf Spot Fruit Speckle Leaf Speckle	ALL	NR	R2
Mancozeb PER81199	M3	Banana Bunches	Banana Fruit Speckle *(Colletotrichum musae and Fusarium spp)*	NSW, NT, QLD & WA	35	R2
Metiram (Polyram)	M3	Bananas	Leaf Spot *(Mycosphaerella musicola)* Black Pit Cordana Leaf Spot Fruit Speckle Leaf Spot	ALL	NR	R2
Peroxyacetic Acid		Sanitiser / Post-Harvest Treatment	Bacteria	ALL	NR	-
Petroleum Oil		Bananas	Cercospora Leaf Spot, Leaf Speckle, Cordana Leaf Spot	NSW, QLD	1	-
Prochloraz (Sportak)	3	Bananas / Post-Harvest Spray	Anthracnose (Black-End) *(Colletotrichum musae)*	QLD, NSW, WA & NT	NR	-
Propiconazole (Tilt)	3	Bananas	Leaf Spot *(Mycosphaerella musicola)* Leaf Speckle *(Mycosphaerella musae)* Cordana Leaf Spot *(Cordana johnstonii)*	QLD, NSW, WA & NT	1	R2
			Black Sigatoka *(Mycosphaerella fijiensis)*	QLD, WA & NT		

Active Ingredient (Trade Name)	Chemical Group	Situation	Diseases / Comments	States	WHP Days	Regulatory Risk
Pyraclostrobin (Cabrio)	11	Bananas / bagged	Leaf Speckle *(Mycosphaerella musae)* Leaf Spot *(Mycosphaerella musicola)* Black Sigatoka *(Mycosphaerella fijiensis)*	ALL	NR	-
Pyrimethanil (Scala)	9	Bananas	Yellow Sigatoka *(Mycosphaerella musicola)* Leaf Speckle *(Mycosphaerella musae)* Cordana Leaf Spot *(Cordana musae)*	QLD, NSW, WA & NT	NR	-
Tebuconazole (Folicur)	3	Bananas	Leaf Spot /Yellow Sigatoka Leaf Speckle Black Sigatoka	QLD, NSW, WA & NT	1	R3
Thiabendazole (Tecto)	1	Bananas / Post-Harvest Dip	Squirter Disease *(Nigrospora musae)* Black-End Rot *(Gloeosporium musarum)*	NSW, WA	NR	-
			Crown Rot Black-End Rot *(Gloeosporium musae)* *Fusarium, Deightoniella, Verticillium spp*	QLD, WA		
Trifloxystrobin (Flint)	11	Bananas	Yellow Sigatoka Black Sigatoka Cordana Leaf Spot	QLD, NSW, WA & NT	NR	-
Zineb	M3	Bananas	Cercospora Leaf Spot Speckle	QLD, NSW & WA	7	R2

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

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
Acephate (Orthene)	1B	Bananas	Banana Scab Moth *(Nacoleia octasema)* Banana Flower Thrips *(Thrips hawaiiensis)* Banana Rust Thrips *(Chaetanaphothrips signipennis)*	QLD, NSW, WA, NT	NR	R3
Bacillus thuringiensis (DiPel DF)	11	Fruit	Lepidopteran larvae including Armyworm, Cotton Bollworm, Native Budworm, Cabbage Moth, Cabbage White Butterfly, Green Looper, Light Brown Apple Moth, Pear Looper, Soybean Looper, Vine Moth and Tobacco Looper.	ALL	NR	-
Bifenthrin (Talstar 100EC / 250EC)	3A	Bananas	Banana Weevil Borer *(Cosmopoliles sordidus)* Banana Rust Thrips *(Chaetanaphothrips signipennis)*	QLD, NSW, WA, NT	1	-
			Strawberry Spider Mite *(Tetranychus lambi)*	QLD, WA	8	
Bifenthrin (Talstar 80SC)	3A	Bananas	Banana Scab Moth (*Nacoleia octasema*)	QLD	NR	-
			Flower Thrips (*Thrips florum*)	QLD, NSW		
Bifenthrin (Talstar) PER89389	3A	Bananas / Within Panama Disease Tropical Race 4 Destruction Zone	Banana Weevil Borer *(Cosmopoliles sordidus)*	QLD	NR NG	-
Cadusafos (Rugby)	1B	Bananas	Burrowing Nematode *(Radopholus similis)* Root-Knot Nematode *(Meloidogyne spp)* Spiral Nematode *(Heliotylenchus dihystern)*	NSW, WA	14	-
			Burrowing Nematode *(Radopholus similis)* Banana Weevil Borer *(Cosmopoliles sordidus)*	QLD		
Chlorpyrifos (Lorsban)	1B	Bananas	Banana Scab Moth	QLD	14	R1

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
			Banana Weevil Borer	QLD, NSW		
			Caterpillars	NSW		
Chlorpyrifos (Lorsban) PER14240	1B	Bananas / Dusting Bunches	Sugar Cane Bud Moth Banana Scab Moth Banana Rust Thrips Mealybugs Caterpillars	NSW, QLD, NT, WA	14	R1
Clofentozine (Apollo)	10A	Bananas	Two-Spotted Mite *(Tetranychus urticae)* Strawberry Spider Mite *(Tetranychus lambi)*	QLD, NSW, WA	NR	-
Clothianidin (Shield) Sumitomo	4A	Bananas	Weevil Borer Rust Thrips	ALL	NR	R2
Diazinon	1B	Bananas	Banana Beetle Borer	NSW	14	R3
			Banana Rust Thrip	QLD		
Deltamethrin (MagMED) PER92548	3A	Tropical Fruit / Trap	Mediterranean Fruit Fly (*Ceratitis capitata*)	WA	NR	-
Dimethoate PER13859	1B	Fruit Fly Host Crops / Orchard Cleanup	Fruit Fly	ALL	NR	R1
Ethyl Formate (Vapormate)		Bananas / Post-Harvest Fumigant	Mites *(Oligotetranychus spp)* Mealybugs *(Dysmicoccus spp)* Scale *(Aspidiotus spp)* Coffee Bean Weevil *(Araecerus fasciculatus)*	ALL	NR	-
Etoxazole (Paramite) Sumitomo	10B	Bananas	Strawberry Mite *(Tetranychus lambi)*	ALL	1	-

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
Fenamiphos (Nemacur)	1B	Banana Planting Material	Soil-Borne Plant Parasitic Nematodes	QLD, NSW & WA	NR	
Fenbutatin Oxide (Torque)	12A	Bananas	Two-Spotted Mite *(Tetranychus urticae)* Banana Spider Mite *(Tetranychus lambi)*	QLD, NSW, NT	1	R2
Fipronil (Regent)	2B	Bananas	Banana Rust Thrips *(Chaetanaphothrips signipennis)* Banana Weevil Borer *(Cosmopolites sordidus)*	QLD, NSW, WA, NT	NR	-
Imidacloprid (Confidor Guard)	4A	Bananas – Cavendish	Banana Rust Thrips *(Chaetanaphothrips signipennis)*	NTH QLD, NT, NTH WA	NR	R2
			Banana Weevil Borer *(Cosmopolites sordidus)*	QLD, NSW, NT, WA		
		Bananas – Lady Finger	Banana Weevil Borer *(Cosmopolites sordidus)*	QLD, NSW, NT, WA		
Imidacloprid (Confidor Guard) + Paraffinic Oil PER14850	4A	Banana / Control Susceptible Disease Vectors	Banana Aphid	ALL	NH NG	R2
Metaldehyde + Fipronil (Transcend)	2B	Bananas	European Earwigs Portuguese Millipedes Slaters Snails & Slugs	ALL	NR NG	-
Oxamyl (Vydate) Corteva	1A	Bananas	Banana Weevil Borer (*Cosmopolites sordidus*) Burrowing Nematode (*Radopholus similis*) Spiral Nematode (*Heliocotylenchus* spp.)	NSW, QLD, NT & WA	NR NG	
Petroleum Oil		Bananas	Scale Insects	QLD, NSW, WA	1	-

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
Potassium Salts of Fatty Acid (Natrasoap)		Fruit Trees	Aphids Thrips Mealybug Two-Spotted Mite Spider Mite Whitefly	ALL	NR	-
Propargite (Omite)	12C	Bananas	Two-Spotted Mite	QLD, NSW, ACT, WA	7	R3
Prothiofos (Tokuthion)	1B	Bananas Bananas (harvested or fallen stools)	Banana Weevil Borer	QLD, NSW, NT, WA	NR	-
		Banana Plant (residual plant only)		NSW		
Pyridaben (Sanmite)	10A	Bananas	Strawberry Mite *(Tetranychus lambi)* Two-Spotted Mite *(Tetranychus urticae)*	QLD, NSW, WA & NT	1	-
Pyriproxyfen (Distance Ant Bait) Sumitomo	7C	Tropical Fruit Plantation / Ant Bait	Invasive and Nuisance Ants	ALL	NR	-
Spinetoram (Success Neo) Corteva	5	Bananas	Banana Rust Thrips Sugarcane Bud Moth	ALL	NR	-
		Tropical and Sub-Tropical Fruit Crops (Inedible Peel)	Flower-Eating Caterpillars Leafrollers & Loopers Yellow Peach Moth Red-Banded Thrips Sorghum Head Caterpillar			

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
Spinetoram (Success Neo) Corteva PER87198	5	Bananas	Banana Rust Thrips *(Chaetanaphothrips signipennis)* Banana Flower Thrips *(Thrips hawaiiensis)* Flower-Eating Caterpillars such as Sugarcane Bud Moth *(Opogona glycyphaga)* Scab Moth *(Nacoleia octasema)*	NSW, NT, QLD & WA	NR	-
Spinosad (Entrust Organic) Corteva	5	Bananas	Banana Rust Thrips Sugarcane Bud Moth	ALL	NR	-
		Tropical & Sub-Tropical Fruit Crops (inedible peel)	Flower Eating Caterpillars Leafrollers & Loopers Yellow Peach Moth Red-Banded Thrips Sorghum Head Caterpillar			
Spinosad (Naturalure) Corteva	5	Tree, Fruit, Nut, Vine & Vegetable Crops / Fruit Fly Bait	Queensland Fruit Fly *(Bactrocera tryoni)* Mediterranean Fruit Fly *(Ceratitis capitata)*	ALL	NR	-
Spirotetramat + Imidacloprid (Movento Energy) Bayer	23+4A	Bananas - Cavendish	Banana Rust Thrips *(Chaetanaphothrips signipennis)*	NTH QLD, NT & NTH WA	NR	R2
			Banana Weevil Borer *(Cosmopolites sordidus)*	QLD, NSW, NT & WA		
		Bananas – Lady Finger				
Spirotetramat + Imidacloprid (Movento Energy) Bayer PER88359	23+4A	Bananas	Banana Aphid *(Pentalonia nigronervosa)*	QLD, NSW, NT & WA	NR	R2
Sulfur PER9409	UN	Banana Bunches	Mites *(Tetranychus lambi*, *Tetranychus urticae)*	NSW, QLD	NR	-

Active Ingredient (Trade Name)	Chemical group	Situation	Pests / Comments	States	WHP Days	Regulatory Risk
Terbufos (Counter)	1B	Bananas	Banana Weevil Borer Burrowing Nematode *(Radopholus similis)*	ALL	NR	R3
Tetraniliprole (Vayego Forte) Bayer	28	Banana	Banana Weevil Borer	ALL	NR	-
Trichlorfon PER12450	1B	Banana	Queensland Fruit Fly (*Bactrocera tryoni*) Mediterranean Fruit Fly (*Ceratitis capitata*)	ALL (excl. VIC)	7 G:7	R2

Appendix 3. Products available for weed control in bananas

Active ingredient (Trade Name)	Chemical Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory Risk
2,2-DPA	0**	Bananas / Directed Spray	Annual and perennial grasses.	7	NSW, QLD	-
Carfentrazone	14**	Tropical & Sub-Tropical Fruit	Broadleaf Weeds	NR G:14	ALL	-
Carfentrazone-Ethyl + Glufosinate (Hellcat) AgNova	14** + 10**	Banana / Directed or Shielded Spray	Grass & Broadleaf Weeds	NR G:56	ALL	R3
Carfentrazone-Ethyl + Glyphosate (Broadway)	14** + 9**	Tropical & Sub-Tropical Fruit	Broadleaf Weeds	NR G:14	ALL	R3
Diquat + Paraquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Grass and broadleaf weeds	H:NR G:7	ALL	R3
Diuron	5**	Bananas / Directed Spray	Grass and broadleaf weeds	NR	NSW, QLD & WA	R3
Fluazifop – P (Fusilade)	1***	Banana / directed spray	Grass weeds	NR	NSW, QLD, NT & WA	-
Flumioxazin (Chateau) + Glufosinate (Basta) PER90376	14**+10**	Banana / Directed Spray / Residual Weed Control	Joyweed (*Alternanthera sessilis*)	63	QLD	R3
Glufosinate (Basta)	10**	Banana / Directed or Shielded Spray	Grass and broadleaf weeds	H:NR G:56	ALL	R3
Glyphosate (Roundup)	9**	Banana / Directed Spray, Shielded Spray or Wick Wiper	Grass and broadleaf weeds	NR	ALL	R3

Active ingredient (Trade Name)	Chemical Group	Situation	Comment / Use / Weed	WHP (days)	States	Regulatory Risk
Haloxyfop (Verdict)	1***	Bananas / Directed Spray or Spot Spray	Grass weeds	NR	ALL	-
Oryzalin	3**	Banana / Directed Spray	Grass and broadleaf weeds	NR	ALL	-
Paraquat (Gramoxone)	22**	Bananas / Directed Spray	Grass and broadleaf weeds	H:NR G:1	QLD, VIC, TAS, SA, WA & NT	R3
Paraquat + Diquat (SpraySeed)	22**	Bananas / Directed Spray or Spot Spray	Grass and broadleaf weeds	H:NR G:7	ALL	R3
Pendimethalin (Stomp)	3**	Banana / Directed Spray, Requires Incorporation	Grass and broadleaf weeds	NR	ALL	-

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

Appendix 4. Plant Growth Regulators available in bananas

Active ingredient (Trade Name)	Chemical Group	Situation	Comment / Use	WHP (days)	States	Regulatory risk
1-Methylcyclopropene	PGR	Bananas / Post-Harvest	Improved quality after shipping, storage & handling	NR	ALL	-
2,4-D	4**	Bananas / Stem Injection / Sucker Destruction	Control of Banana Suckers	NR	QLD	R3
Diesel Distillate PER14237		Bananas / Cut Stump or Injection	Control of Banana Suckers	NR	NSW, QLD, WA & NT	-
Ethephon PER14966	PGR	Bananas	Crop Timing Management	NR	QLD	-
Glyphosate (Roundup) PER14850	9	Banana / Injection	Destruction of Banana Plants	NH NG	ALL	R3

Appendix 5. Current permits for use in bananas

Permit ID	Description	Date Issued	Expiry Date	Permit holder
PER12450 Version 7	Trichlorfon / Banana / Fruit Fly	6-Oct-11	30-Nov-25	Hort Innovation
PER13859 Version 2	Dimethoate / Orchard Cleanup Fruit Fly Host Crops / Fruit Fly	09-Feb-15	31-Jul-24	Hort Innovation
PER14237 Version 3	Diesel Distillate / Banana / Removal of Unwanted Suckers	1-Dec-13	31-Dec-24	Hort Innovation
PER14240 Version 4	Chlorpyrifos / Bananas / Sugarcane Bud Moth, Banana Scab Moth, Banana Rust Thrips, Caterpillars, Mealy Bugs	28-Jun-13	31-Jul-24	Hort Innovation
PER14850 Version 4	Glyphosate, Imidacloprid, Paraffinic Oil / Bananas / Control of Susceptible Disease Vectors	1-Oct-14	30-Sep-24	Hort Innovation
PER14966 Version 4	Ethephon / Bananas / Crop Timing Management	23-Dec-14	31-May-28	Hort Innovation
PER81199 Version 2	Mancozeb / Banana Bunches / Banana Fruit Speckle	27-Oct-15	30-Jun-26	Hort Innovation
PER86485 Version 2	Benzalkonium Chloride, Didecyldimethyl Ammonium Chloride / Sanitising, Decontaminating / Banana / Fusarium Wilt (Panama Disease)	12-Jul-18	31-May-28	Hort Innovation
PER87198 Version 2	Spinetoram (Success Neo) / Bananas / Banana Rust Thrips, Banana Flower Thrips, Flower Eating Caterpillars	5-Feb-19	31-Oct-25	Hort Innovation
PER88359 Version 2	Imidacloprid & Spirotetramat / Bananas / Banana Aphid	15-Dec-19	31-Oct-25	Hort Innovation
PER89389 Version 2	Bifenthrin / Bananas / Banana Weevil Borer	19-Nov-20	31-Jul-28	Hort Innovation
PER90376	Flumioxazin & Glufosinate / Banana Plantation / Joyweed	16-Dec-21	31-Dec-24	NQ Banana Growers Assn
PER92548	Deltamethrin (MagMED) / Tropical Fruit / Mediterranean Fruit Fly	7-Sep-22	30-Sep-25	Sustainable Ventures Pty Ltd
PER92657	Glyphosate / Banana / Banana Freckle Emergency Use Permit	11-Aug-22	31-Aug-24	NT Dept of Industry, Tourism & Trade
PER9409 Version 3	Sulfur Dust / Banana Bunches / Mites	1-Oct-06	30-Sep-24	Hort Innovation

Appendix 6. Banana Maximum Residue Limits (MRLs)

CODEX commodity groupings of bananas and subgroups:

	Fruits
FI 0030	Tropical & Subtropical fruit – Inedible Peel
FI 2022	Tropical & Subtropical, Inedible Smooth Peel - Large
FI 0327	Banana

Note: Australia has a limited amount of international trade in bananas, with the little trade that does occur being dominated by dried banana products. 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
2,2-DPA	FI 0327	Banana	*0.1	-
Acetamiprid	FI 0030	Tropical & Subtropical fruit – Inedible Peel	0.2	-
Acephate	FI 0327	Banana	1	-
Acibenzolar-S-Methyl	FI 0327	Banana	-	0.06
Afidopyropen	FI 0327	Banana	0.1	-
Aldrin and Dieldrin		Fruits	E0.05	-
	FI 0327	Banana	E0.05	-
Amitrole	FI 0327	Banana	*0.01	-
Azoxystrobin	FI 0327	Banana	-	2
Bifenthrin	FI 0327	Banana	0.1	0.1
Bitertanol	FI 0327	Banana	-	0.5
Boscalid	FI 0327	Banana	-	0.6
Buprofezin	FI 0327	Banana	-	0.3
Cadusafos	FI 0327	Banana	*0.01	0.01
Carbendazim	FI 0327	Banana	-	0.2
Carbofuran	FI 0327	Banana	-	*0.01
Carfentrazone-ethyl	FI 0030	Tropical & Subtropical fruit – Inedible Peel	*0.05	-
Chlorothalonil	FI 0327	Banana	3	15
Chlorpyrifos	FI 0327	Banana	T0.5	-
Clofentezine	FI 0327	Banana	*0.01	-
Clothianidin (see also thiamethoxam)	FI 0327	Banana	*0.02	0.02
Diazinon		Fruit	0.5	-
DDT		Fruits	E1	-
Dicofol		Fruit {except strawberry}	5	-
Didecyl Dimethyl Ammonium Chloride	FI 0030	Tropical & Subtropical fruit – Inedible Peel	20	-
Difenoconazole	FI 0327	Banana	*0.02	0.1
Dimethoate	FI 0030	Tropical & Subtropical fruit – Inedible Peel {except avocado, mango, pineapple}	5	-
Diquat		Fruit	*0.05	-
	FI 0327	Banana	-	*0.02

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Dithianon		Fruits {except blueberries}	2	-
Dithiocarbamates	FI 0327	Banana	T15	2
Diuron	FI 0327	Banana	0.5	-
Epoxiconazole	FI 0327	Banana	1	-
Ethephon	FI 0327	Banana	T*0.05	-
Ethoprophos	FI 0327	Banana	-	0.02
Etoxazole	FI 0327	Banana	0.2	-
Fenamiphos	FI 0327	Banana	*0.05	*0.05
Fenbuconazole	FI 0327	Banana	0.5	0.05
Fenbutatin oxide	FI 0030	Tropical & Subtropical fruit – Inedible Peel	5	-
	FI 0327	Banana	-	10
Fenpicoxamid	FI 0327	Banana	-	0.15
Fenpropimorph	FI 0327	Banana	-	2
Fipronil	FI 0327	Banana	*0.01	0.005
Fluazifop-p-butyl	FI 0327	Banana	*0.02	*0.01
Flumioxazin	FI 0327	Banana	T*0.02	-
Fluopyram	FI 0327	Banana	0.1	0.8
Flusilazole	FI 0327	Banana	-	0.03
Flutriafol	FI 0327	Banana	-	0.3
Fluxapyroxad	FI 0327	Banana	0.7	3
Glufosinate and Glufosinate-ammonium	FI 0030	Tropical & Subtropical fruit – Inedible Peel	0.2	-
	FI 0327	Banana	-	0.2
Glyphosate	FI 0327	Banana	0.2	*0.05
Haloxyfop	FI 0030	Tropical & Subtropical fruit – Inedible Peel	*0.05	-
	FI 0327	Banana	-	*0.02
Imazalil	FI 0327	Banana	-	Po3
Imidacloprid	FI 0327	Banana	0.5	0.05
Inorganic bromide		Fruits {except avocado, citrus, dried fruits, strawberry}	20	-
Inpyrfluxam	FI 0327	Banana	0.7	
Isoprothiolane	FI 0327	Banana	-	1
Isopyrazam	FI 0327	Banana	-	0.06
Isotianil	FI 0327	Banana	0.03	-
Isoxaben	FI 0030	Tropical & Subtropical fruit – Inedible Peel	*0.01	-
Lindane		Fruit {except Apple, Cherries, Cranberry, Grapes, Peach, Pineapple, Plums, Strawberry}	E0.5	-
Malathion / Maldison		Fruits {except Berries and other small fruits; Citrus fruits; Dried fruits; Stone fruits}	2	-
Metaldehyde		Fruit	1	-
Metconazole	FI 0327	Banana	-	*0.1
Methamidophos	FI 0327	Banana	0.2	-
Methiocarb		Fruit {except citrus fruits, grapes}	T0.1	-
Methyl bromide		Fruit {except jackfruit, litchi, mango, papaya}	T*0.05	-

Chemical	Codex Code	Description	APVMA MRL mg/kg	Codex MRL mg/kg
Omethoate	FI 0030	Tropical & Subtropical fruit – Inedible Peel {except avocado, mango, pineapple}	2	-
Oryzalin		Fruit	0.1	-
Oxamyl	FI 0327	Banana	0.2	-
Oxyfluorfen	FI 0030	Tropical & Subtropical fruit – Inedible Peel	*0.01	-
Paclobutrazol	FI 0030	Tropical & Subtropical fruit – Inedible Peel {except avocado, mango}	*0.01	-
Paraquat		Fruits {except olives}	*0.05	-
	FI 0030	Tropical & Subtropical fruit – Inedible Peel	-	*0.01
Pendimethalin	FI 0030	Tropical & Subtropical fruit – Inedible Peel	*0.05	-
Phosphine	FI 0030	Tropical & Subtropical fruit – Inedible Peel	T*0.01	-
Piperonyl butoxide		Fruit	8	-
Pirimicarb		Fruit {except blackberries}	0.5	-
Prochloraz	FI 0327	Banana	5	-
	FI 0030	Tropical & Subtropical fruit – Inedible Peel	-	Po7
Propargite	FI 0327	Banana	3	-
Propiconazole	FI 0327	Banana	0.2	0.1
Prothiofos	FI 0327	Banana	*0.01	-
Pyraclostrobin	FI 0327	Banana	*0.02	*0.02
Pyrethrins		Fruit	1	-
Pyridaben	FI 0327	Banana	0.5	-
Pyrimethanil	FI 0327	Banana	2	0.1
Pyriproxyfen	FI 0030	Tropical & Subtropical fruit – Inedible Peel	0.3	-
Saflufenacil	FI 0327	Banana	-	0.01
Simazine		Fruit	*0.1	-
Spinetoram	FI 0030	Tropical & Subtropical fruit – Inedible Peel	0.3	-
Spinosad	FI 0030	Tropical & Subtropical fruit – Inedible Peel	0.3	-
Spirotetramat	FI 0327	Banana	0.3	-
Tebuconazole	FI 0327	Banana	0.2	1.5
Terbufos	FI 0327	Banana	0.05	0.05
Tetraniliprole	FI 0327	Banana	*0.01	-
Thiabendazole	FI 0327	Banana	3	Po5
Thiamethoxam	FI 0327	Banana	-	*0.02
Triadimefon	FI 0327	Banana	-	1
Triadimenol	FI 0327	Banana	-	1
Trichlorfon	FI 0030	Tropical & Subtropical fruit – Inedible Peel	T3	-
Trifloxystrobin	FI 0327	Banana	0.5	0.05
Trifluralin		Fruit	*0.05	-

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

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

Banana Agrichemical Regulatory Risk Assessment

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

Active Constituents	Chemical Group	Pest Name	Comment
INSECT AND OTHER PESTS			
Acephate	**1B**	Banana flower thrips	APVMA: nominated for review Canada: Reviewed, continued use with risk mitigation EU/UK: No authorisation in place
		Banana rust thrips	
		Banana scab moth	
Bacillus thuringiensis	**11A**	Banana scab moth	EU: Under review for authorisation renewal
Bifenthrin	**3A**	Banana flower thrips	Canada: Not authorised EU/UK: Not authorised
		Banana rust thrips	
		Banana scab moth	
		Banana weevil borer	
		Strawberry(Banana) spider mite	
Cadusafos	**1B**	Banana weevil borer	EU/UK: No authorisation in place
		Burrowing nematode	
		Root-knot nematodes	
		Spiral nematode	
Chlorpyrifos	**1B**	Banana flower thrips	APVMA: Proposed deletion of uses. Codex: All MRLs revoked Canada: Cancellation of all uses. EU/UK: No authorisation in place USA: EPA decision to cancel use on food crops
		Banana weevil borer	
		Cluster caterpillar	
		Passionvine mite	
		Banana rust thrips (PER14240)	
		Banana scab moth (PER14240)	
		Caterpillars(PER14240)	
		Mealybugs (PER14240)	
		Sugarcane bud moth (PER14240)	

Banana Agrichemical Regulatory Risk Assessment

Active Constituents	Chemical Group	Pest Name	Comment
Clofentezine	**10A**	Strawberry (Banana) spider mite Two-spotted (Red spider) mite	EU: Proposed restriction of use non-edible crops in permanent greenhouses
Clothianidin	**4A**	Banana rust thrips Banana weevil borer	APVMA: Under review Canada: Field uses cancelled or amended EU/UK: Not authorised USA: Re-registration with new risk mitigation measures
Diazinon	**1B**	Banana rust thrips Banana weevil borer	APVMA: Proposed deletion of uses EU/UK: No authorisation in place Codex: All MRLs revoked
Dimethoate (Po)	**1B**	Fruit fly	Codex: MRL deletion recommended. EU/UK: Not authorised
Etoxazole	**10B**	Strawberry(Banana) spider mite	EU: Use on greenhouse ornamentals only & Candidate for substitution
Fenamiphos	**1B**	Nematodes	EU/UK: Not authorised
Fenbutatin oxide	**12B**	Strawberry(Banana) spider mite Two-spotted (Red spider) mite	APVMA: nominated for review Codex: To be reviewed by JMPR. EU/UK: No authorisation in place USA: Under review
Fipronil	**2B**	Banana rust thrips Banana weevil borer	APVMA: Under review Codex: Re-evaluation underway EU/UK: No authorisation in place USA: Under review
Imidacloprid	**4A**	Banana rust thrips Banana weevil borer Grey back cane beetle (Larvae)	APVMA: Under review Canada: Field uses cancelled or amended EU/UK: No authorisations USA: Re-registration with new risk mitigation measures
Oxamyl	**1A**	Banana weevil borer Burrowing nematode Spiral nematode	EU: Candidate for substitution and under review

Active Constituents	Chemical Group	Pest Name	Comment
Paraffinic oil	UNM	Scale insects	
Propargite	**12C**	Two-spotted (Red spider) mite	APVMA: nominated for review EU/UK: No authorisations
Prothiofos	**1B**	Banana weevil borer	Codex: No MRLs EU/UK: No authorisation in place
Pyridaben	**21A**	Strawberry(Banana) spider mite	
		Two-spotted (Red spider) mite	
Pyriproxyfen	**7C**	Ants (various)	
Spinetoram	**5**	Flower eating caterpillars	EU: Approval expiry June 2024
		Leafroller (Tortrix) caterpillars	
		Leafroller moths	
		Loopers	
		Redbanded thrips	
		Sorghum head caterpillar	
		Yellow peach moth	
		Banana flower thrips (PER87198)	
		Banana rust thrips (PER87198)	
		Banana scab moth (PER87198)	
		Sugarcane bud moth (PER87198)	
		Fall armyworm Spinetoram (PER89241)	
Spinosad	**5**	Banana rust thrips	
		Sugarcane bud moth	
		Fall armyworm (PER89870)	

Banana Agrichemical Regulatory Risk Assessment

Active Constituents	Chemical Group	Pest Name	Comment
Spirotetramat + imidacloprid	**23 + 4A**	Banana rust thrips	Imidacloprid APVMA: Under review Canada: Field uses cancelled or amended EU/UK: No authorisations USA: Re-registration with new risk mitigation measures Spirotetramat EU: Approval expiry April 2024
		Banana weevil borer	
		Banana aphid(PER88359)	
Sulfur	**M2**	Bunch mites (PER9409)	
Terbufos	**1B**	Banana weevil borer	Codex: Unsupported EU/UK: No authorisation in place
		Burrowing nematode	
Tetraniliprole	**28**	Banana weevil borer	EU: No authorisations
Trichlorfon	**1B**	Fruit fly (PER12450)	APVMA: nominated for review Codex: No MRLs EU/UK: No authorisations USA: No MRLs

Active Constituents	Chemical Group	Pest Name	Comment
DISEASES			
Bacillus amyloliquefaciens	**BM02**	Leaf speckle (Suppression)	
		Yellow sigatoka	
Chlorothalonil	**M5**	Leaf speckle	APVMA: nominated for review Canada: Cancellation of uses proposed EU/UK: No authorisation in place USA: Under review
		Yellow Sigatoka (Leaf spot)	
Copper	**M1**	Anthracnose (Black end)	EU: Candidates for substitution
		Leaf speckle	
		Phytophthora stem rot	
		Trunk (Stem) canker	
		Yellow Sigatoka (Leaf spot)	
Didecyl dimethyl NH_4Cl	-	Panama disease	EU: No authorisation in place
	-	Sanitizer	
Difenoconazole	**3**	Black Sigatoka	APVMA: nominated for review EU: Candidate for substitution USA: Under review
		Yellow Sigatoka (Leaf spot)	
Epoxiconazole	**3**	Leaf speckle	APVMA: nominated for review EU/UK: No authorisation
		Yellow Sigatoka (Leaf spot)	
Fluopyram	**7**	Cordana leaf spot	
		Leaf speckle	
		Yellow Sigatoka (Leaf spot)	

Banana Agrichemical Regulatory Risk Assessment

Active Constituents	Chemical Group	Pest Name	Comment
Fluopyram + tebuconazole	**7 + 3**	Cordana leaf spot Leaf speckle Yellow Sigatoka (Leaf spot)	Tebuconazole APVMA: nominated for review Canada: Under review EU: Candidate for substitution USA: Under review
Fluxapyroxad	**7**	Leaf speckle Yellow Sigatoka (Leaf spot)	
Inpyrfluxam	**7**	Yellow Sigatoka	EU: Authorisation pending
Iodine (post-harvest)	**M**	Fungi	
Isotianil	**PO3**	Leaf speckle Yellow sigatoka	EU/UK: No authorisations
Mancozeb	**M3**	Anthracnose (Black end) Black pit Cordana leaf spot Deightoniella fruit spot Fruit speckle (PER81199) Leaf speckle Yellow Sigatoka (Leaf spot)	APVMA: nominated for review Canada: Many uses cancelled Codex: To be reviewed EU/UK: No authorisations
Metiram	**M3**	Black pit Cordana leaf spot Fruit speckle Leaf speckle Yellow Sigatoka (Leaf spot)	APVMA: nominated for review Canada: All foliar uses other, than potato, cancelled Codex: To be reviewed EU/UK: No authorisations
Paraffinic oil	**-**	Black Sigatoka Cercospora leaf spot Cordana leaf spot Leaf speckle Yellow Sigatoka (Leaf spot)	
Prochloraz	**3**	Anthracnose (Black end)	Codex: Periodic re-evaluation scheduled EU: No authorisation

Banana Agrichemical Regulatory Risk Assessment

Active Constituents	Chemical Group	Pest Name	Comment
Propiconazole	3	Black Sigatoka	APVMA: nominated for review EU/UK: No authorisations USA: Under review
		Cordana leaf spot	
		Leaf speckle	
		Yellow Sigatoka (Leaf spot)	
Pyraclostrobin	11	Black Sigatoka	Canada: Under review
		Leaf speckle	
		Yellow Sigatoka (Leaf spot)	
Pyrimethanil	9	Cordana leaf spot	Canada: Under review
		Leaf speckle	
		Yellow Sigatoka (Leaf spot)	
Tebuconazole	3	Black Sigatoka	APVMA: nominated for review Canada: Under review EU: Candidate for substitution USA: Under review
		Leaf speckle	
		Yellow Sigatoka (Leaf spot)	
Thiabendazole	1	Anthracnose (Black end)	
		Black tip	
		Crown rot	
		Ripe fruit spot	
		Squirter	
Trifloxystrobin	11	Black Sigatoka	Canada: Review initiated
		Cordana leaf spot	
		Yellow Sigatoka (Leaf spot)	
Zineb	M3	Leaf speckle	APVMA: nominated for review Codex: To be reviewed EU/UK: No authorisation in place
		Yellow Sigatoka (Leaf spot)	

Active Constituents	Chemical Group	Comment
WEEDS		
2, 2 DPA	**0**	
2, 4-D	**4**	
Carfentrazone	**14**	
Carfentrazone + glufosinate	**14 +10**	Glufosinate Canada: Review proposed EU/UK: Not authorised
Carfentrazone + glyphosate	**14 + 9**	Glyphosate Ongoing issues internationally
Diquat	**22**	APVMA: Currently under review EU/UK: Not authorised
Diuron	**4**	EU/UK: Not authorised
Fluazifop-P	**1**	
Flumioxazin (PER90376)	**14**	
Glufosinate	**10**	Canada: Review proposed EU/UK: Not authorised
Glyphosate	**9**	Ongoing issues internationally EU: Under review
Haloxyfop-P	**1**	EU/UK: No authorisation in place
Oryzalin	**3**	EU: No authorisation in place
Paraquat	**22**	APVMA: Currently under review Canada: Review initiated EU/UK: No authorisation in place Rotterdam Convention - nomination
PLANT GROWTH REGULATOR		
1-methylcyclopropene	-	
Ethephon (PER14966)	-	

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