TomatoesNZ

2025 NEW ZEALAND RESIDUE COMPLIANCE INFORMATION

FOR FRESH GREENHOUSE TOMATOES

This edition has been upgraded to include how biological pest controls maybe impacted by the agrichemicals that you use. TNZ has conducted trials with A Lighter Touch into using biological pests as part of an Integrated Pest Management system and this booklet now includes a section on the effect of activates on the main beneficial insects that greenhouse growers might choose to use. When choosing your pest controls, we recommend referencing these charts so that you fully understand possible impacts on your biological control options. This guide is intended to assist you with your choices in growing the most sustainable and healthy fresh tomatoes.

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Biopesticides

General principles for Good Management Practices

WHAT ARE BIOPESTICIDES?

Biopesticides are alternatives to conventional synthetic pesticides. They include live microbes (such as bacteria, fungi and viruses) and/or their extracts, crude or purified plant extracts, pheromones and other natural biochemicals. Biopesticides work best when incorporated into an integrated pest management programme utilising a range of control measures. They are different to biostimulants and biofertilisers since they claim pest control activity rather than just promotion of plant growth.

WHAT REGULATORY APPROVAL IS NEEDED FOR THEIR USE?

In New Zealand, the regulatory process for biopesticides is the same as for conventional chemical pesticides. The product must be registered under the ACVM (Agricultural and Veterinary Medicines) Act. They can be categorised as biofungicides, bioinsecticides and bioherbicides.

HOW DO THEY WORK?

Biopesticides can work in a number of different ways. Some products only have one mode of action whilst others have multiple modes of action.

- **Attraction/repellency** Produce compounds that disrupt the normal behaviour of insect pests.
- **Competition** Microbes can out-compete plant pathogens for space and other resources and prevent the pathogen from infecting the plant.
- **Physical action** Produce compounds that cause cell leakage, desiccation and death in the target pest.
- **Parasitism** Microbes can infect/colonise a target pest/pathogen and kill it.
- **Toxicity** Microbes/plants can produce a compound that has a direct toxic effect on the target pest.
- **Induced resistance** Microbes/plants can produce compounds that stimulate the crop plant's general resistance to pest/pathogen attack.

BIOPESTICIDE BENEFITS

Biopesticides may seem more challenging to use than conventional chemicals, but they provide a number of benefits.

Low resistance risk
Biopesticides have a low risk of resistance developing because of their multiple modes of action. They can be integrated into IPM systems to extend the life of agrichemicals.

Residue management
Biopesticides are exempt from MRL residue targets and therefore can be used close to harvest time when other chemicals are not suitable.

Low environmental impact
Biopesticides often have good compatibility with beneficial insects and are generally regarded as safer for the environment. Many biopesticides have a zero or low re-entry and handling interval.

HOW TO USE BIOPESTICIDES

Storage
It is very important to follow the label guidelines, particularly around storage. Products based on living microbes can be affected by extreme heat and cold, so storing at ambient temperature is usually recommended, although some products need to be refrigerated. Some products must be used immediately and cannot be resealed and stored. Biopesticides are subject to the same regulations as chemical pesticides and need to be held in an approved store.

Environment
Biopesticides can be sensitive to environmental conditions so check labels carefully. Many biopesticides should be applied in the evening to avoid the heat of the day and some benefit from being applied with UV protectants. Most biopesticides are not systemic or rain fast so re-application will be needed if there is a significant rainfall event.

Application
Most foliar biopesticides are protectants, so it is important to apply them before pest/disease symptoms appear and to make sure that good plant coverage is achieved. Use the specified nozzle to prevent blockages. When using products based on live microbes clean your spray system very well before adding and don't use chlorinated water. Biopesticides may need to be reapplied at 7-10 day intervals.

Compatibility
Check label recommendations around adjuvant use and tank mixing as live microbes may be affected by other crop protection products.

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QUESTIONS TO ASK WHEN BUYING BIOPESTICIDES

What is the active ingredient?
If it is a crude preparation (plant extract or mix of microbes) ask about the consistency of the product with respect to quality assurance. If it's a single microbe/ pure compound ask for specific identifications eg specific strain of a microbe. If you get vague answers – buyer beware.

How does it work?
Don't accept vague or overly complicated answers. Understanding how the product works is the key to understanding how to use it properly. Cross reference what the company rep tells you with what is on the label.

What field trial data can you show me?
Reputable companies selling good products will have good trial data to back up their claims. Don't accept pot trial data (poor translation to field efficacy) and be cautious with field data on other crops/pests.

How should I use the product?
Ask for detailed information on how the product should be used and what other products it is compatible with. Beware of vague answers or claims that it can be used exactly like a chemical.

If something sounds too good to be true – it will be.

Biopesticides are not stand-alone solutions. They work best when incorporated into an integrated pest management programme utilising a range of control measures.

A selection of biopesticides and other products registered in New Zealand for use on indoor tomato crops

Bio-insecticides

Biologicals

Active Ingredient	Trade name examples	Agrichemical group	More info
AZADIRACHTIN	Naturally Neem	Biological	Page 8
BACILLUS THURINGIENSIS	Bactercide WG, Biobit DF, Dipel DF, Dipel ES, Bactur	Biological	Page 9
BEAUVERIA BASSIANA	Contego BB, Beaugenic, Beaublast	Biological	Page 9
VERTICILLIUM LECANII	eNtokill, eNtoblast	Biological	Page 16

Bio-fungicides

Microbials:

Active Ingredient	Trade name examples	Agrichemical group	More info
BACILLUS AMYLOLIQUEFACIENS	Triplex	Microbial	Page 24
BACILLUS SUBTILIS	Donaghys Foliactive, Bacstar, Serenade Max	Microbial	Page 24
Mineral Oil:			
MINERAL OIL	Excel Oil - Organic	Mineral oil	Page 30
Other:			
BENZALKONIUM CHLORIDE	Spotless, Surrender, Graphic Biocide, Winter Clean-up, Yield	n/a	Page 25
CHLORINE DIOXIDE	Biospray	n/a	Page 26
POTASSIUM BICARBONATE	Ecocarb, K-pow	n/a	Page 31

IMPORTANT, PLEASE READ:

Safe use of agrichemicals

Effects of insecticides & fungicides on beneficial insects

This document provides fresh tomato growers with MRL (Maximum Residue Limit) and WHP (Withholding Period) compliance information for the New Zealand market. Where the WHP is not known, growers should exercise caution using these products (e.g. application timing etc.). This information is specific to fresh tomatoes grown under cover and excludes field grown tomatoes. Grower's must read and follow labels and controls to meet the required domestic and export MRLs. When using a product that contains multiple active ingredients, it is the grower's responsibility to ensure that residues do not exceed the MRL for every active ingredient that product contains. It is also the grower's responsibility to ensure they comply with any other use controls such as maximum application rates / frequency restrictions. Some NZ MRLs for older pesticides have been set to cover "vegetables or fruiting vegetables" in general and may no longer reflect current Good Agricultural Practice. For some compounds, greenhouse tomato label claims do not exist and efficacy, phytotoxicity / plant safety etc. needs to be considered when using these products. Off label uses are not illegal unless registration conditions state otherwise and provided residues comply with the NZ MRL (set or default).

Some EPA controls have not been included in this spreadsheet as they are not expected to apply to closed glasshouse use of compounds. These include restrictions on applying substances to water, restrictions on aerial application, and requirements to take steps to prevent spray drift off of the property on which the product is applied. If growers are using crop protection compounds outside of the glasshouse, please check the EPA controls database and refer to the product label, prior to use.

WorkSafe Requirements

The Health and Safety at Work (Hazardous Substances) Regulations 2017 also impose some requirements around the use of crop protection compounds, such as the need for workers to be provided with PPE, and the requirement for signage at entrances to a site, where large quantities of certain hazardous substances are used. Guidance on WorkSafe's requirements are here: https://worksafe.govt.nz/topic-and-industry/hazardous-substances/

Businesses are required to keep an inventory of all their hazardous substances, which includes not only crop protection products, but cleaning products and fuel as well. WorkSafe has an online hazardous substance calculator tool that can assist in determining what key requirements growers must comply with. This tool can be found here: https://worksafe.govt.nz/topic-and-industry/hazardous-substances/managing/inventory/

Resistance Management

When using agricultural chemicals growers should be aware of managing resistance. Resistance in a pest, disease or weed population can develop from repeat use of an agricultural chemical. This can become an issue because of high selection pressure exerted on a pest, disease or weed population over several seasons. This is generally the result of several seasons, as a result of repeated use of the same or several chemicals with the same or similar mode of action.

To reduce the risk of resistance, most chemicals have a IRAC/FRAC/HRAC code based on the biochemical process that the pesticide disrupts the pest, disease or weed's biology. Use these codes as a resistance management strategy by rotating the chemicals that you apply. The IRAC/FRAC/HRAC code can be found on the product label.

For further information refer to:
https://www.vri.org.nz/research/new-research-document-page-54/
http://resistance.nzpps.org/
www.irac-online.org
www.frac.info
www.hracglobal.com

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References

The information contained in this document was correct at the time of collation in 2024.

ACVM Label database:
https://eatsafe.nzfsa.govt.nz/web/public/acvm-register

MRLs are outlined in the MRL Standard which is regularly updated:
https://www.mpi.govt.nz/processing/agricultural-compounds-and-vet-medicines/maximum-residue-levels-for-agricultural-compounds/

Export MRLs
https://www.mpi.govt.nz/news-and-resources/resources/registers-and-lists/maximum-residue-levels-database/

EPA controls database:
https://www.epa.govt.nz/database-search/approved-hazardous-substances-with-controls/

Managing spray drift
Guidance information is available from TomatoesNZ:
https://www.tomatoesnz.co.nz/industry/research/members-research/spray-drift/

This document should be read in conjunction with the NZGAP document **'Guideline for off label use of agrichemicals in Horticulture'** found here: https://www.nzgap.co.nz/NZGAP_Public/Growers/Guidelines/NZGAP_Public/Growers/Guidelines.aspx

Insecticides

Technote

Off-label use of Benevia®, Mainman®, Movento OD®, Calypso® for early season whitefly control in Greenhouse Tomatoes

KEY INFORMATION

- Benevia®, Mainman®, Movento® OD, and Calypso® may provide whitefly control early in the growing cycle before releasing the biological control, *Encarsia formosa*.
- Preharvest intervals are recommended.
- These four insecticides are each in a different mode of action group, providing additional options for insecticide resistance management.
- Make no more than two applications of each product to greenhouse tomatoes.
- Observe the maximum per hectare application rates for Benevia®, Mainman®, and Movento® OD.

BACKGROUND

To assist growers to access and use new insecticides, Tomatoes NZ carried out greenhouse trials through the A Lighter Touch programme to calculate appropriate pre harvest intervals (PHIs) for Benevia®, Mainman®, Movento® OD, and Calypso® in greenhouse tomatoes.

There are no registered use claims for Benevia®, Mainman®, Movento® OD, or Calypso® in greenhouse tomato crops.

Benevia® and Movento® OD are registered for use on field tomatoes, and MRLs have been set by MPI for both products in tomatoes. However, because the label is restricted to field tomatoes, trials were needed to establish an appropriate PHI for greenhouse tomatoes to meet the New Zealand MRLs for Benevia® and Movento® OD.

Mainman® and Calypso® have no registered uses for tomatoes, and no MRLs have been set for tomatoes. However, off-label use is permitted in New Zealand, as long as the default MRL of 0.10 mg/kg is not exceeded.

This Technote summarises the results of this research, so that growers know what use pattern of Benevia®, Mainman®, Movento® OD, and Calypso® will result in residues that do not exceed the New Zealand MRLs.

The PHIs for all of these products are relatively long, and it is suggested that the most suitable timing for their use is for whitefly control early in the growing cycle before releasing the biological control, *Encarsia formosa*.

DESCRIPTION OF THE INSECTICIDE PRODUCTS

Benevia® is a Group 28 insecticide, containing 100g/litre cyantraniliprole in the form of an oil dispersion. It has a field tomato label claim for control of Tomato potato psyllid, potato tuber moth, green peach aphid, and tomato fruit worm. Benevia® enters larvae mainly by ingestion, but also by contact, resulting in rapid cessation of feeding, but death may not occur for 3-6 days, depending on pest species.

Mainman® is a Group 29 insecticide, containing 500g/kg flonicamid in the form of a water dispersible granule. Mainman® has systemic and translaminer activity, controlling target pests by contact and ingestion by causing rapid and irreversible cessation of feeding. Death may take several days to occur. The product has a label claim for aphids and Tomato potato psyllid in potato crops.

Movento® OD is a Group 23 insecticide containing 150g/litre spirotetramat in the form of an oil dispersion. Movento® OD has systemic activity (both xylem- and phloem-mobile) and is registered for control of Tomato potato psyllid in field tomatoes and green peach aphid in potatoes.

Calypso® is a systemic Group 4 insecticide containing 480g/litre thiacloprid in the form of a suspension concentrate. It has label claims for the control of armoured scales, bronze beetle, codling moth, mealy bugs, Froggatt's apple leafhopper and Fuller's rose weevil in apples, thrips in avocados, armoured scales in kiwifruit, and thrips in nectarines and peaches.

GUIDANCE FOR OFF-LABEL USE OF BENEVIA®, MAINMAN®, MOVENTO® OD, AND CALYPSO®

Growers should follow NZGAP's Guideline for Growers whenever using agrichemicals off-label (https://www.nzgap.co.nz/NZGAP_Public/Growers/Guidelines.aspx).

Benevia®, Mainman®, Movento® OD, and Calypso® may be used off-label, however growers should check with their customers (supermarkets, marketing companies etc.) in case they have rules against off-label use.

Product	Rate	Use pattern and controls
Benevia®	33 ml Benevia®/ 100 litres of water.	• Maximum of 2 applications with a minimum spray interval of 7 days (refer to the Benevia label regarding specific pests). • Apply the final spray no later than 28 days before harvest. • DO NOT exceed the application rate – the maximum application rate[1] is 500ml Benevia® (50g active ingredient) per hectare, per application. • Observe label directions regarding honeybees.
Mainman®	11g Mainman® / 100 litres of water.	• Maximum of 2 applications with a minimum spray interval of 7 days. • Apply the final spray no later than 35 days before harvest. • DO NOT exceed the application rate – the maximum application rate[1] is 160g Mainman® (80g active ingredient) per hectare, per application.
Movento® OD	37ml Movento® OD /100 litres of water.	• Maximum of 2 applications with a minimum spray interval of 7 days. • Apply the final spray no later than 35 days before harvest. • DO NOT exceed the application rate – the maximum application rate[1] is 560ml Movento® OD (84g active ingredient) per hectare, per application.
Calypso®	30ml Calypso® / 100 litres of water.	• Maximum of 2 applications with a minimum spray interval of 7 days. • Apply the final spray no later than 35 days before harvest.

[1] *Maximum application rate as established by the Environmental Protection Authority.*

RESIDUE TESTING

The residue trial for this project was carried out in one greenhouse on a single cherry tomato variety. Based on the results of these trials, we expect that a final spray application of Benevia® 28 days before harvest, and Movento® OD, Mainman®, and Calypso® 35 days before harvest will result in any residues being below the applicable New Zealand MRL. However, we still recommend that growers regularly undertake residue testing to ensure that their fruit remains compliant with the required MRLs. We also recommend that crop safety tests are carried out by growers on a small crop area before wider application.

Any residue exceeding the relevant MRL should be notified to Tomatoes NZ so that this information can then be added to the knowledge base.

ABAMECTIN

Trade Name Examples: Apostle, Avid, Invert EW, Verdex, Tripsol

Agrichemical Group: Avermectin

IRAC (Insecticide Resistance Action Committee mode of action number): 6

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 0.10 {108} Sum of parent B1a and B1b components

Additional NZ EPA controls by trade name: Tripsol: The maximum application rate for Tripsol shall be 0.85 L/ha (19.13 g acrinathrin/ha and 10.71 g abamectin/ha) with a maximum application frequency of 4 applications per year and a minimum application interval of 7 days.

ACRINATHRIN

Trade Name Examples: Tripsol

Agrichemical Group: Synthetic Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Tripsol: The maximum application rate for Tripsol shall be 0.85 L/ha (19.13 g acrinathrin/ha and 10.71 g abamectin/ha) with a maximum application frequency of 4 applications per year and a minimum application interval of 7 days.

ALPHA-CYPERMETHRIN

Trade Name Examples: Bestseller 100EC, Cypher, Dominex 100, Ken-Tac 100

Agrichemical Group: Synthetic Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: No additional controls

AZADIRACHTIN

Trade Name Examples: NeemAQ, Neem Azal-T/S, BioNeem, Naturally Neem

Agrichemical Group: Biological

IRAC (Insecticide Resistance Action Committee mode of action number): UN: Compounds of unknown or uncertain mode of action

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt (insecticide)

Additional NZ EPA controls by trade name: No additional controls

BACILLUS THURINGIENSIS

Trade Name Examples: Agree WDG, Bactercide WG, Biobit DF, Dipel ES, Bactur

Agrichemical Group: Biological

IRAC (Insecticide Resistance Action Committee mode of action number): 11A

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

BEAUVERIA BASSIANA

Trade Name Examples: Contego BB, Beaugenic, Beaublast

Agrichemical Group: Biological

IRAC (Insecticide Resistance Action Committee mode of action number): UNF: Fungal agents of unknown or uncertain mode of action

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: Beaublast and Beaugenic: Application is restricted to ground-based application.
Beaugenic: Workers must use respiratory protection when mixing, loading and applying the substance, or undertaking tasks during the restricted entry interval. A restricted entry interval of 4 hours applies.

BIFENTHRIN

Trade Name Examples: Venom, Assail

Agrichemical Group: Synthetic Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.05

Additional NZ EPA controls by trade name: No additional controls

BUPROFEZIN

Trade Name Examples: Applaud 40SC, Mortar, Ovation 50 WDG, Pilan 500Sc

Agrichemical Group: Buprofezin

IRAC (Insecticide Resistance Action Committee mode of action number): 16

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 0.50

Additional NZ EPA controls by trade name: No additional controls

CARBARYL

Trade Name Examples: Sevin Flo

Agrichemical Group: Carbamate

IRAC (Insecticide Resistance Action Committee mode of action number): 1A

Registered on indoor tomato?: Yes

Witholding Period (days): 1

Maximum Residue Limit (mg/kg): 3.00

Additional NZ EPA controls by trade name: Grochem Carbaryl & Sevin Flo: Maximum application rate of 2700g carbary/ha, can be used up to 3 times/crop cycle. Restricted Entry Interval: An REI of 17 days applies (from 10th June 2025). A person may only re-enter the area if PPE and RPE is worn as though that person were applying the substance and if entering an indoor tented area, for the purposes of carrying out tasks associated with ventilation of the building

CHLORANTRANILIPROLE

Trade Name Examples: Ampligo

Agrichemical Group:

IRAC (Insecticide Resistance Action Committee mode of action number): 28

Registered on indoor tomato?: No

Witholding Period (days): off-label

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Ampligo: The maximum application rate of AMPLIGO® is 100 mL product/ha, with a maximum of 3 applications per season.

CHROMOBACTERIUM SUBTSUGAE

Trade Name Examples: Grandevo

Agrichemical Group: Biological

IRAC (Insecticide Resistance Action Committee mode of action number): NC: Not classified. Target site and code unknown.

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: Grandevo is likely to leave heavy deposits on fruit from high volume spray application. Maximum application rate of 1020g a.i./ha. Maximum of 4 applications per year, with a minimum of 7 days between applications. Must be applied using ground-based methods only. Do not apply into or onto water. Must not be applied when wind speeds are less than 3km/hr or greater than 20 km/hr.

CYANTRANILIPROLE

Trade Name Examples: Benevia insecticide, Exirel insecticide, Minecto Star

Agrichemical Group: Diamide

IRAC (Insecticide Resistance Action Committee mode of action number): 28

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Benevia: Ground-based application methods only. A maximum application rate of 50g/ai/ha, up to 3 applications per year, with a minimum application interval of 7 days. Only spray after daily honey bee flight unless the application rate is less than or equal to 20 g ai/ha and spraying after daily honeybee flights is not possible.

Exirel: as above except maximum application rate is 15g/ai/ha.

Minecto Star: Do not apply within 10 days of a plant being likely to flower. Maximum application rate of 150g/product/ha, up to 3 times per year with a minimum application interval of 14 days. Ground-based application only (includes airblast), and nozzles must provide a medium or coarse droplet size.

CYPERMETHRIN

Trade Name Examples: Ripcord

Agrichemical Group: Synthetic Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: No additional controls

DELTAMETHRIN

Trade Name Examples: Ballistic Insecticide, Deltaphar 25EC

Agrichemical Group: Synthetic Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.05 {7} Sum of isomers or enantiomers or diasteriomers

Additional NZ EPA controls by trade name: Proteus: Ground-based application only

FATTY ACIDS (K SALTS)

Trade Name Examples: Clenza, Natures Way Natrasoap Veggie Insect Gun, Protector

Agrichemical Group: Fatty acids

IRAC (Insecticide Resistance Action Committee mode of action number): n/a

Registered on indoor tomato?: No

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): exempt (C8+)

Additional NZ EPA controls by trade name: No additional controls

FLONICAMID

Trade Name Examples: Mainman

Agrichemical Group: Flonicamid

IRAC (Insecticide Resistance Action Committee mode of action number): 29

Registered on indoor tomato?: Yes

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Maximum application rate of 160 g product/ha (equivalent to 80 g flonicamid/ha). Do not apply into or onto water. Do not allow entry into treated areas until the spray has dried, unless wearing cotton overalls buttoned to the neck and wrist (or equivalent clothing) and chemical resistant gloves. Clothing should be laundered after each day's use. Do not apply [product name] to any plant likely to be visited by bees or in areas where bees are foraging at the time of (or immediately after) application, until spray has dried.

LAMBDA-CYHALOTHRIN

Trade Name Examples: Ampligo, Cyhella, Halex, Kaiso, Karate Zeon, Lavron, Lavron 50WG

Agrichemical Group: Synthetic Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Cyhella, Halex, Karate Zeon: No additional controls
Restricted Entry Interval: - An REI of 48 hours applies (from 10th June 2025). A person may only re-enter the area during this time if PPE and RPE is worn as though that person were applying the substance and if entering an indoor tented area, for the purposes of carrying out tasks associated with ventilation of the building
Lavron 50WG: Ground based application only.

MINERAL and NON MINERAL OILS

Trade Name Examples: D-C-Tron Plus (Organic) Spray Oil, Eco Oil EnSpray 99, Excel Oil, Excel Spring Oil, Organic JMS Stylet Oil

Agrichemical Group: n/a

IRAC (Insecticide Resistance Action Committee mode of action number): n/a

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): exempt (paraffin oils)

Additional NZ EPA controls by trade name: EnSpray 99: The substance must be applied via ground-based methods only.

Caution: Can cause serious crop damage in greenhouse crops

PERMETHRIN

Trade Name Examples: Ambush, Attack

Agrichemical Group: Synthetic Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 0.50 {7} Sum of isomers or enantiomers or diasteriomers

Additional NZ EPA controls by trade name: Ambush & Attack: Contains pirimiphos-methyl. Maximum application rate of 1425 g pirimiphos-methyl/ha up to 4 times per crop cycle. Application with a hand-gun spray is not permitted. Restricted Entry Interval - REI of 48 hours applies (from 10th June 2025). A person may only re-enter the area during this time if PPE and RPE is worn as though that person were applying the substance and if entering an indoor tented area, for the purposes of carrying out tasks associated with ventilation of the building.

PIRIMICARB

Trade Name Examples: Aphidex 800WG, Pirimor 50, Piritek, Prohive

Agrichemical Group: Carbamate

IRAC (Insecticide Resistance Action Committee mode of action number): 1A

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 1.00 {31} Sum of parent plus -desmethyl and -desmethylformamido metabolites

Additional NZ EPA controls by trade name: Dovetail: See 'Dovetail' under Lambda-cyhaolthrin.
All other listed trade name products: Restricted Entry Interval - An REI of until dry applies. A person may only re-enter the area during this time if PPE and RPE is worn as though that person were applying the substance and if entering an indoor tented area, for the purposes of carrying out tasks associated with ventilation of the building

PIRIMIPHOS-METHYL

Trade Name Examples: Actellic 50EC, Actellic Dust, Attack, Silo 500EC, Ambush

Agrichemical Group: Organophosphates

IRAC (Insecticide Resistance Action Committee mode of action number): 1B

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 1.00

Additional NZ EPA controls by trade name: Attack and Ambush: Maximum application rate of 1425 g pirimiphos-methyl/ha up to 4 times per crop cycle. Application with a hand-gun spray is not permitted. Controls apply to all products containing pirimophos-methyl: Restricted Entry Interval - REI of 48 hours applies (from 10th June 2025). A person may only re-enter the area during this time if PPE and RPE is worn as though that person were applying the substance and if entering an indoor tented area, for the purposes of carrying out tasks associated with ventilation of the building.

PYMETROZINE

Trade Name Examples: Bravium, Chess WG, Endgame, Minecto Star, Worthide Xtra

Agrichemical Group: Pyridine azomethine

IRAC (Insecticide Resistance Action Committee mode of action number): 9

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 0.50

Additional NZ EPA controls by trade name: Bravium: Maximum application rate for Bravium is 210 g ai/ha, with a maximum application frequency of 3 applications per season and a minimum application interval of 7 days. Ground-based application only.
Chess WG - No additional controls
Minecto Star - See 'Minecto Star' listed under cyantraniliprole
Worthide Xtra: Maximum application rate of 200g pymetrozine/ha with maximum application frequency of 3 applications per season and a minimum interval of 7 days between applictaions. Ground use only

PYRETHRINS

Trade Name Examples: Beat A Bug, Pyganic, Pylon, ZETaPY

Agrichemical Group: Pyrethroid

IRAC (Insecticide Resistance Action Committee mode of action number): 3A

Registered on indoor tomato?: Yes

Witholding Period (days): 1

Maximum Residue Limit (mg/kg): 1.00

Additional NZ EPA controls by trade name: Pyganic: Workers must not be exposed to concentrations of pyrethrins, greater than 5mg/m^3
Zetapy: Maximum application rate of 56g active ingredient / ha, up to 5 times per season

PYRIPROXYFEN

Trade Name Examples: Relent, Admiral

Agrichemical Group: Pyriproxyfen

IRAC (Insecticide Resistance Action Committee mode of action number): 7

Registered on indoor tomato?: Yes

Witholding Period (days): 1

Maximum Residue Limit (mg/kg): 1.00

Additional NZ EPA controls by trade name: No additional controls

SPINETORAM

Trade Name Examples: Sparta, Uphold

Agrichemical Group: Spinosyns

IRAC (Insecticide Resistance Action Committee mode of action number): 5

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.02 {62} Sum of spinosyn J and spinosyn L

Additional NZ EPA controls by trade name: Sparta & Uphold: Ground based application - Maximum application rate of 500ml/product/ha, up to 4 applications per season, with a minimum of 7 days between applications.
For airblast sprayers - Maximum application rate of 800ml/product/ha, up to 4 applications per season, with a minimum of 14 days between applications.

SPINOSAD

Trade Name Examples: Entrust Naturalyte Insect Control

Agrichemical Group: Spinosyns

IRAC (Insecticide Resistance Action Committee mode of action number): 5

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.05 {60} Sum of spinosyn A and spinosyn D

Additional NZ EPA controls by trade name: No additional controls

SPIROMESIFEN

Trade Name Examples: Oberon, Optimite

Agrichemical Group: Tetronic and Tetramic acid derivatives

IRAC (Insecticide Resistance Action Committee mode of action number): 23

Registered on indoor tomato?: Yes

Witholding Period (days): 1

Maximum Residue Limit (mg/kg): 0.50

Additional NZ EPA controls by trade name: Oberon: Maximum application rate of 144g/a.i./ha, up to two applications per season. Ground-based application methods only.
Optimite: Maximum application rate of 144g/a.i./ha, up to two applications per crop cycle. Ground-based application methods only.

SPIROTETRAMAT

Trade Name Examples: Movento, Supremis 100SC, GroVentive

Agrichemical Group: Tetronic and Tetramic acid derivatives

IRAC (Insecticide Resistance Action Committee mode of action number): 23

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.30 {90} Sum of parent and its -enol metabolite

Additional NZ EPA controls by trade name: Supremis 100SC: Maximum application rate of this substance is 960 mL/ha (equivalent to 0.096 kg spirotetramat/ha) per application, with a maximum application frequency of 3 per season. No additional controls. May cause harm to off-target plants

SULFOXAFLOR

Trade Name Examples: Transform

Agrichemical Group: Sulfoximine

IRAC (Insecticide Resistance Action Committee mode of action number): 4C

Registered on indoor tomato?: Yes - Fruiting vegetable

Witholding Period (days): 1

Maximum Residue Limit (mg/kg): 1.00

Additional NZ EPA controls by trade name: Maximum ground based application rate of 96 g ai / ha, up to 4 applications per year with a minimum interval of 14 days between applications. Do not apply this product in areas where bees are foraging or to any plant likely to be visited by bees (a) at the time of application; or (b) before the spray has dried following application

TEBURENOZIDE

Trade Name Examples: Approve 70 WP, Comic

Agrichemical Group: Diacylhydrazines

IRAC (Insecticide Resistance Action Committee mode of action number): 18

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Approve WP: Maximum application rate of 180g/a.i/ha, up to four applications per season, with a minimum of 14 days between applications. Ground-based application only.

THIACLOPRID

Trade Name Examples: Alpasso, Calypso

Agrichemical Group: Neonicotinoid

IRAC (Insecticide Resistance Action Committee mode of action number): 4A

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Alpasso, Calypso no additional controls.

VERTICILLIUM LECANII

Trade Name Examples: eNtokill, eNtoblast

Agrichemical Group: Biological

IRAC (Insecticide Resistance Action Committee mode of action number): n/a

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: Ground based application only

Insecticides Compatibility

Bumblebees

ACTIVE INGREDIENTS	IMPACT	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
ABAMECTIN	Remove	2 Days	Yes
ACRINATHRIN	Remove	2 Days	Yes
ALPHA-CYPERMETHRIN	Incompatible*		No
AZADIRACHTIN	Cover		Yes
BACILLUS THURINGIENSIS			Yes
BEAUVERIA BASSIANA	No Action		Yes
BIFENTHRIN	Incompatible*	7 Days	No
BUPROFEZIN	Cover		Yes
CARBARYL	Remove	2 Days	Yes
CYANTRANILIPROLE	No Action		No
CYPERMETHRIN	Incompatible*	14 Days	Yes
DELTAMETHRIN	Remove	3 Days	No
DICHLORVOS	Remove	2 Days	Yes
ESFENVALERATE	Incompatible*	15 Days	No
FATTY ACIDS (K SALTS)	Cover		No
FLONICAMID	No Action		No
IMIDACLOPRID	Incompatible*	30 Days	No
LAMBDA-CYHALOTHRIN	Incompatible*	15 Days	No
METHOMYL	Remove	3 Days	Yes
MINERAL and Non mineral OILS	Remove	1 Day	No
PERMETHRIN	Incompatible*	9 Days	Yes
PIRIMICARB	Remove	1 Day	Yes
PIRIMIPHOS-METHYL	Incompatible*		No
PYMETROZINE	No Action		Yes
PYRETHRINS	Remove	1 Day	Yes
PYRIPROXYFEN	No Action		Yes
SPINETORAM			No
SPINOSAD	Cover	1 Day	No
SPIROMESIFEN	No Action		Yes
SPIROTETRAMAT	Remove	1 Day	No
SULFOXAFLOR			Yes - fruiting vegetables
TEBUFENOZIDE	No Action		No
THIACLOPRID	No Action		No
VERTICILLIUM LECANII			Yes

*Bumblebees will not pollinate the crop for a minimum duration of the persistence period

Insecticides Compatibility

Parasitoids

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
ABAMECTIN	Very harmful - 76 to 100% mortality	3 Weeks	Yes
ACRINATHRIN	Very harmful - 76 to 100% mortality		Yes
ALPHA-CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
AZADIRACHTIN	Moderately harmful - 26 to 50% mortality		Yes
BACILLUS THURINGIENSIS	Harmless - 0 to 25% mortality		Yes
BEAUVERIA BASSIANA			Yes
BIFENTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
BUPROFEZIN	Moderately harmful - 26 to 50% mortality	0 Weeks	Yes
CARBARYL	Very harmful - 76 to 100% mortality	3 Weeks	Yes
CYANTRANILIPROLE			No
CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
DELTAMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
DICHLORVOS	Very harmful - 76 to 100% mortality	1 Week	Yes
ESFENVALERATE	Very harmful - 76 to 100% mortality	8-12 Weeks	No
FATTY ACIDS (K SALTS)	Very harmful - 76 to 100% mortality	0 Weeks	No
FLONICAMID	Harmless - 0 to 25% mortality	0 Weeks	No
IMIDACLOPRID	Very harmful - 76 to 100% mortality	>12 Weeks	No
LAMBDA-CYHALOTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
METHOMYL	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
MINERAL and Non mineral OILS	Harmless - 0 to 25% mortality	0 Weeks	No
PERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
PIRIMICARB	Moderately harmful - 26 to 50% mortality	<1 Week	Yes
PIRIMIPHOS-METHYL	Very harmful - 76 to 100% mortality	6-8 Weeks	No
PYMETROZINE	Harmless - 0 to 25% mortality		Yes
PYRETHRINS	Very harmful - 76 to 100% mortality	0 Weeks	Yes
PYRIPROXYFEN	Harmful - 51 to 75% mortality		Yes
SPINETORAM	Very harmful - 76 to 100% mortality	1 Week	No
SPINOSAD	Harmful - 51 to 75% mortality	1 Week	No
SPIROMESIFEN	Harmless - 0 to 25% mortality	0 Weeks	Yes
SPIROTETRAMAT	Moderately harmful - 26 to 50% mortality		No
SULFOXAFLOR	Very harmful - 76 to 100% mortality	2 Weeks	Yes - fruiting vegetables
TEBUFENOZIDE	Harmless - 0 to 25% mortality		No
THIACLOPRID	Harmful - 51 to 75% mortality		No
VERTICILLIUM LECANII			Yes

Insecticides Compatibility

Mirids

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
ABAMECTIN	Very harmful - 76 to 100% mortality	1 Week	Yes
ACRINATHRIN	Very harmful - 76 to 100% mortality		Yes
ALPHA-CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
AZADIRACHTIN	Moderately harmful - 26 to 50% mortality		Yes
BACILLUS THURINGIENSIS	Harmless - 0 to 25% mortality		Yes
BEAUVERIA BASSIANA			Yes
BIFENTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
BUPROFEZIN	Harmless - 0 to 25% mortality		Yes
CARBARYL	Very harmful - 76 to 100% mortality	8 Weeks	Yes
CYANTRANILIPROLE			No
CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
DELTAMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
DICHLORVOS	Very harmful - 76 to 100% mortality	1 Week	Yes
ESFENVALERATE	Very harmful - 76 to 100% mortality	8-12 Weeks	No
FATTY ACIDS (K SALTS)	Very harmful - 76 to 100% mortality		No
FLONICAMID	Harmless - 0 to 25% mortality	0 Weeks	No
IMIDACLOPRID	Very harmful - 76 to 100% mortality	4-6 Weeks	No
LAMBDA-CYHALOTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
METHOMYL	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
MINERAL and Non mineral OILS	Very harmful - 76 to 100% mortality	1 Week	No
PERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
PIRIMICARB	Moderately harmful - 26 to 50% mortality	2-3 Weeks	Yes
PIRIMIPHOS-METHYL	Very harmful - 76 to 100% mortality		No
PYMETROZINE	Harmful - 51 to 75% mortality	1 Week	Yes
PYRETHRINS			Yes
PYRIPROXYFEN	Harmless - 0 to 25% mortality	0 Weeks	Yes
SPINETORAM	Harmful - 51 to 75% mortality		No
SPINOSAD	Harmful - 51 to 75% mortality	3-6 Weeks	No
SPIROMESIFEN	Harmless - 0 to 25% mortality		Yes
SPIROTETRAMAT	Harmless - 0 to 25% mortality		No
SULFOXAFLOR	Very harmful - 76 to 100% mortality	2 Weeks	Yes - fruiting vegetables
TEBUFENOZIDE	Harmless - 0 to 25% mortality		No
THIACLOPRID	Very harmful - 76 to 100% mortality		No
VERTICILLIUM LECANII			Yes

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Insecticides Compatibility

Lacewings

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
ABAMECTIN	Very harmful - 76 to 100% mortality	>1 Week	Yes
ACRINATHRIN	Harmful - 51 to 75% mortality	0 Weeks	Yes
ALPHA-CYPERMETHRIN	Very harmful - 76 to 100% mortality		No
AZADIRACHTIN	Harmless - 0 to 25% mortality		Yes
BACILLUS THURINGIENSIS	Harmless - 0 to 25% mortality		Yes
BEAUVERIA BASSIANA			Yes
BIFENTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
BUPROFEZIN	Harmless - 0 to 25% mortality		Yes
CARBARYL	Very harmful - 76 to 100% mortality	4 Weeks	Yes
CYANTRANILIPROLE	Harmless - 0 to 25% mortality	0 Weeks	No
CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
DELTAMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
DICHLORVOS	Very harmful - 76 to 100% mortality	1 Week	Yes
ESFENVALERATE	Very harmful - 76 to 100% mortality	8-12 Weeks	No
FATTY ACIDS (K SALTS)	Very harmful - 76 to 100% mortality		No
FLONICAMID	Harmless - 0 to 25% mortality	0 Weeks	No
IMIDACLOPRID	Very harmful - 76 to 100% mortality		No
LAMBDA-CYHALOTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
METHOMYL	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
MINERAL and Non mineral OILS	Harmless - 0 to 25% mortality	0 Weeks	No
PERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
PIRIMICARB	Moderately harmful - 26 to 50% mortality		Yes
PIRIMIPHOS-METHYL	Very harmful - 76 to 100% mortality	6-8 Weeks	No
PYMETROZINE	Harmless - 0 to 25% mortality	0 Weeks	Yes
PYRETHRINS	Moderately harmful - 26 to 50% mortality	1 Week	Yes
PYRIPROXYFEN	Harmless - 0 to 25% mortality	0 Weeks	Yes
SPINETORAM	Very harmful - 76 to 100% mortality		No
SPINOSAD	Very harmful - 76 to 100% mortality		No
SPIROMESIFEN	Moderately harmful - 26 to 50% mortality		Yes
SPIROTETRAMAT	Harmless - 0 to 25% mortality	0 Weeks	No
SULFOXAFLOR	Harmless - 0 to 25% mortality		Yes - fruiting vegetables
TEBUFENOZIDE	Harmless - 0 to 25% mortality	0 Weeks	No
THIACLOPRID	Harmful - 51 to 75% mortality		No
VERTICILLIUM LECANII			Yes

Insecticides Compatibility

Mites

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
ABAMECTIN	Very harmful - 76 to 100% mortality	2 Weeks	Yes
ACRINATHRIN	Very harmful - 76 to 100% mortality		Yes
ALPHA-CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
AZADIRACHTIN	Harmless - 0 to 25% mortality		Yes
BACILLUS THURINGIENSIS	Harmless - 0 to 25% mortality		Yes
BEAUVERIA BASSIANA			Yes
BIFENTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
BUPROFEZIN	Harmless - 0 to 25% mortality	0 Weeks	Yes
CARBARYL	Very harmful - 76 to 100% mortality	6-8 Weeks	Yes
CYANTRANILIPROLE	Moderately harmful - 26 to 50% mortality		No
CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
DELTAMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
DICHLORVOS	Very harmful - 76 to 100% mortality	1 Week	Yes
ESFENVALERATE	Very harmful - 76 to 100% mortality	8-12 Weeks	No
FATTY ACIDS (K SALTS)	Very harmful - 76 to 100% mortality		No
FLONICAMID	Harmless - 0 to 25% mortality	0 Weeks	No
IMIDACLOPRID	Very harmful - 76 to 100% mortality	2 Weeks	No
LAMBDA-CYHALOTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
METHOMYL	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
MINERAL and Non mineral OILS	Harmful - 51 to 75% mortality		No
PERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
PIRIMICARB	Moderately harmful - 26 to 50% mortality		Yes
PIRIMIPHOS-METHYL	Very harmful - 76 to 100% mortality	6-8 Weeks	No
PYMETROZINE	Harmless - 0 to 25% mortality	0 Weeks	Yes
PYRETHRINS			Yes
PYRIPROXYFEN	Harmless - 0 to 25% mortality	0 Weeks	Yes
SPINETORAM	Harmful - 51 to 75% mortality		No
SPINOSAD	Harmful - 51 to 75% mortality		No
SPIROMESIFEN	Moderately harmful - 26 to 50% mortality		Yes
SPIROTETRAMAT	Moderately harmful - 26 to 50% mortality		No
SULFOXAFLOR	Harmless - 0 to 25% mortality		Yes - fruiting vegetables
TEBUFENOZIDE	Harmless - 0 to 25% mortality		No
THIACLOPRID	Moderately harmful - 26 to 50% mortality		No
VERTICILLIUM LECANII			Yes

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Insecticides Compatibility

Pirate Bugs

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
ABAMECTIN	Very harmful - 76 to 100% mortality	1-6 Weeks	Yes
ACRINATHRIN	Very harmful - 76 to 100% mortality	>4 Weeks	Yes
ALPHA-CYPERMETHRIN	Very harmful - 76 to 100% mortality		No
AZADIRACHTIN	Moderately harmful - 26 to 50% mortality		Yes
BACILLUS THURINGIENSIS	Harmless - 0 to 25% mortality		Yes
BEAUVERIA BASSIANA			Yes
BIFENTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
BUPROFEZIN	Moderately harmful - 26 to 50% mortality	0 Weeks	Yes
CARBARYL	Very harmful - 76 to 100% mortality	8 Weeks	Yes
CYANTRANILIPROLE	Harmless - 0 to 25% mortality	0 Weeks	No
CYPERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
DELTAMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
DICHLORVOS	Very harmful - 76 to 100% mortality	1 Week	Yes
ESFENVALERATE	Very harmful - 76 to 100% mortality	8-12 Weeks	No
FATTY ACIDS (K SALTS)			No
FLONICAMID	Harmless - 0 to 25% mortality	0 Weeks	No
IMIDACLOPRID	Very harmful - 76 to 100% mortality	4-6 Weeks	No
LAMBDA-CYHALOTHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	No
METHOMYL	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
MINERAL and Non mineral OILS	Harmful - 51 to 75% mortality	0 Weeks	No
PERMETHRIN	Very harmful - 76 to 100% mortality	8-12 Weeks	Yes
PIRIMICARB	Moderately harmful - 26 to 50% mortality		Yes
PIRIMIPHOS-METHYL	Very harmful - 76 to 100% mortality		No
PYMETROZINE	Moderately harmful - 26 to 50% mortality	1 Week	Yes
PYRETHRINS	Very harmful - 76 to 100% mortality	1 Week	Yes
PYRIPROXYFEN	Harmless - 0 to 25% mortality	0 Weeks	Yes
SPINETORAM	Very harmful - 76 to 100% mortality	<1 Week	No
SPINOSAD	Moderately harmful - 26 to 50% mortality		No
SPIROMESIFEN	Harmless - 0 to 25% mortality		Yes
SPIROTETRAMAT	Moderately harmful - 26 to 50% mortality		No
SULFOXAFLOR	Harmful - 51 to 75% mortality	1 Week	Yes - fruiting vegetables
TEBUFENOZIDE	Moderately harmful - 26 to 50% mortality		No
THIACLOPRID	Very harmful - 76 to 100% mortality	2 Weeks	No
VERTICILLIUM LECANII			Yes

Fungicides

AMETOCTRADIN

Trade Name Examples: Zampro

Agrichemical Group: Triazolo-pyrimidylamine

***FRAC (Fungicide Resistance Action Committee mode of action number):** 45

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Maximum application rate 0.8 L/ha, up to 4 applications/year with a minimum application interval of 7 days

AZOXYSTROBIN

Trade Name Examples: Atlantis Flo, Inspire, Orbit, Roxy, Amistar, Avior 250 SC, Tazer

Agrichemical Group: Methoxy-acrylates

***FRAC (Fungicide Resistance Action Committee mode of action number):** 11

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.01 {97} Sum of parent plus its Z-isomer

Additional NZ EPA controls by trade name: Atlantis Flo: max rates:
- 126 g a.i./ha, 2 / year, min interval 7 days;
- 201.6 g a.i./ha, 2 / year, min interval 10 days; and
- 252 g a.i./ha, 2 / year, min interval 14 days.

Tazer: 2.4L product/ha (619 g ai/ha) with a maximum of 2 applications per year and a minimum application interval of 14 days.
Avior: max rate 619 g ai/ha, max 2 / year, min interval 14 days.
Amistra Opti: max rate 1.25L/ha, 4 / season. min interval 7 days.
All others: No additional controls.

Caution: Can cause crop damage when used via irrigation

BACILLUS AMYLOLIQUEFACIENS

Trade Name Examples: Triplex, Clarity

Agrichemical Group: Microbial

***FRAC (Fungicide Resistance Action Committee mode of action number):** 44

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

BACILLUS SUBTILIS

Trade Name Examples: Donaghys Foliactive, Bacstar, Serenade Optimum, Serenade Prime

Agrichemical Group: Microbial

***FRAC (Fungicide Resistance Action Committee mode of action number):** 44

Registered on indoor tomato?: No

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

BENZALKONIUM CHLORIDE

Trade Name Examples: Surrender, Graphic Biocide, Winter Clean-up, Yield

Agrichemical Group: n/a

***FRAC (Fungicide Resistance Action Committee mode of action number):** n/a

Registered on indoor tomato?: Yes (certain uses)

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Spotless: Maximum application rate of 22.5 L/ha, up to 8 applications per season. Graphic Biocide, Surrender, Winter Clean-up, Yield : No additional controls

BOSCALID

Trade Name Examples: Colliss, Pristine

Agrichemical Group: Pyridine-carboxamides

***FRAC (Fungicide Resistance Action Committee mode of action number):** 7

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Colliss: Maximum application rate of 0.5L/ha, up to 3 applications / season at 14-21 day intervals, application only by boom or hand held spray. Pristine & Pavo Boss: max rate 1.6 kg/ha, 4 applications / year.

BUPIRIMATE

Trade Name Examples: Nimrod EW Fungicide, Neptune, Evito

Agrichemical Group: Pyrimidine

***FRAC (Fungicide Resistance Action Committee mode of action number):** 8

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Nimrod EW Fungicide, Neptune: No additional controls. Evito: Maximum application rate 1 L/ha, maximum of 3 applications per season.

CARBENDAZIM

Trade Name Examples: Chief, Carbenz, Goldazim 500 SC, MBC 500Flo, MBC 800WDG, Prolific, Protek

Agrichemical Group: Benzimidazole

***FRAC (Fungicide Resistance Action Committee mode of action number):** 1

Registered on indoor tomato?: Yes some TNPs

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 2.00 {186} Sum of carbendazim and thiophanate-methyl, expressed as carbendazim

Additional NZ EPA controls by trade name: No additional controls

Caution: Does kill natural enymies of Pythium when used via irrigation

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

CHLORINE DIOXIDE

Trade Name Examples: Biospray, Oxine

Agrichemical Group: n/a

***FRAC (Fungicide Resistance Action Committee mode of action number):** n/a

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): exempt - Max use 10ppm

Additional NZ EPA controls by trade name: Biospray, Oxine: Maximum application rate: 0.02 kg ai/ha, ground based application only.

CHLOROTHALONIL

Trade Name Examples: Barrack Betterstick, Barrachlor 720, Blizzard 720SC, Bravo Weather Stik, Cavalry, Cannon, Cobra, Taratek 5F, Thalonil, Cleaner, Phatip plus

Agrichemical Group: Chloronitrile

***FRAC (Fungicide Resistance Action Committee mode of action number):** M5

Registered on indoor tomato?: Yes

Witholding Period (days): 7 to 14 days (depending upon product used)

Maximum Residue Limit (mg/kg): 5.00

Additional NZ EPA controls by trade name: Barrachlor 720: For wide dispersive (ie boom and airblast) - maximum application rates 2.5L/ha, 4 applications / year, minimum 7 day interval. For non wide dispersive: maximum rate rate 210 mL/ 100 m2, 4 applications / year, minimum interval of 10 days between applications. Cannon: maximum rate 2 L/ha, 3 applications / season, minimum 14 day interval. Cobra: application rate 2 l substance per hectare, applied every 10-14 days, with no more than 4 applications per season.

COPPER HYDROXIDE

Trade Name Examples: Blue Shield DF, Champ DP, Champ Flo, Kocide Opti, ManKocide DF

Agrichemical Group: Inorganic copper

***FRAC (Fungicide Resistance Action Committee mode of action number):** M1

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

Caution: Can cause crop damage when multiple sprays are done

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

COPPER OXIDE

Trade Name Examples: Nordox 75 WG

Agrichemical Group: Inorganic copper

***FRAC (Fungicide Resistance Action Committee mode of action number):** M1

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

Caution: Can cause crop damage when multiple sprays are done

COPPER OXYCHLORIDE

Trade Name Examples: Agpro Copper Oxychloride 800 WP, Fruitfed Copper Oxychloride, Oxi-Cup 50WG

Agrichemical Group: Inorganic copper

***FRAC (Fungicide Resistance Action Committee mode of action number):** M1

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

Caution: Can cause crop damage when multiple sprays are done

CYPRODINIL

Trade Name Examples: Switch, Evoke, Renovo, Savvy 500 SC, Scylla

Agrichemical Group: Anilinopyrimidine

***FRAC (Fungicide Resistance Action Committee mode of action number):** 9

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Savvy 500SC: Maximum application rate of 0.3 kg cyprodinil/ha, and 0.2 kg fludioxonil/ha per application, with a maximum application frequency of three applications per calendar year. Ground application only. Scylla: ground application only.

DIFENOCONAZOLE

Trade Name Examples: Cannon, Difference 250EC, Divino, Dyfen, Glacier, Score 250 EC, Score 10 WG, Tallos

Agrichemical Group: Triazole

***FRAC (Fungicide Resistance Action Committee mode of action number):** 3

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Cannon: Maximum application rate 2 L/ha , up to 3 times / season, with a mimum of 14 days between applications. Difference 250EC, Divino, Dyfen, Glacier, Score 250EC, Score 10WG, and Tallos: No additional controls.

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

DIMETHOMORPH

Trade Name Examples: Cobra, Sovrin Flo, Sphinx Fungicide, Zampro

Agrichemical Group: Cinnamic acid amide

***FRAC (Fungicide Resistance Action Committee mode of action number):** 40

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Cobra: Maximum application rate 2L of product /ha, no more than 4 applications per season, applied every 10-14 dayss. Zampro: maximum application rate 0.8 L/ha, up to 4 applications / year, with a mimum 7 days interval between applications. Acrobat MZ 690, Sovrin Flo, Sphinx Fungicide: no additional controls.

FLUOXAPIPROLIN

Trade Name Examples: Xivana Prime

Agrichemical Group: OSBPI

***FRAC (Fungicide Resistance Action Committee mode of action number):** 49

Registered on indoor tomato?: No (outdoor only)

Witholding Period (days): off-label / 7 days?

Maximum Residue Limit (mg/kg): 0.09

Additional NZ EPA controls by trade name: The maximum application rate for XIVANA is 1 L/ha (equivalent to 20 g fluoxapiprolin/ha), with a maximum frequency of three applications per year, and a minimum interval of seven days between applications.

FLUAZINAM

Trade Name Examples: Apex, Curalan, Gem Fungicide, Nando, Pinnacle, Nexus

Agrichemical Group: 2,6-dinitro-aniline

***FRAC (Fungicide Resistance Action Committee mode of action number):** 29

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.02

Additional NZ EPA controls by trade name: No other controls

FLUDIOXONIL

Trade Name Examples: Maxim, Switch, Wakil XL, Renovo, Nexus, Savvy 500 SC, Scylla, Fludio

Agrichemical Group: Phenylpyrrole

***FRAC (Fungicide Resistance Action Committee mode of action number):** 12

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Savvy 500SC: maximum application rate 0.3 kg cyprodinil/ha, and 0.2 kg fludioxonil/ha per application, maximum application frequency of 3 applications per calendar year. Ground application only. Scylla: ground application only.

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

FLUOPYRAM

Trade Name Examples: Luna Privilege

Agrichemical Group: Pyridinyl-ethylbenzamides

***FRAC (Fungicide Resistance Action Committee mode of action number):** 7

Registered on indoor tomato?: Yes

Witholding Period (days): 1

Maximum Residue Limit (mg/kg): 1.00

Additional NZ EPA controls by trade name: Maximum application rate 300 mL product /ha (equivalent to 150 g/ha of fluopyram), with a maximum of one application in any 365 day period, except when used in greenhouses on crops separated from the soil. Maximum application rate when used in greenhouses on crops separated from the soil is 600 mL product /ha (equivalent to 300 g/ha of fluopyram), maximum of two applications in any 365 day period, and a minimum interval between applications of seven days. REI 13 days for greenhouse use on fruiting vegetables.

IPRODIONE

Trade Name Examples: Ippon 500SC, Rapid 500, Rovral Aquaflo

Agrichemical Group: Dicarboximide

***FRAC (Fungicide Resistance Action Committee mode of action number):** 2

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 6.00

Additional NZ EPA controls by trade name: No additional controls

KRESOXIM-METHYL

Trade Name Examples: Colliss

Agrichemical Group: Oximino-acetates

***FRAC (Fungicide Resistance Action Committee mode of action number):** 11

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Colliss: Maximum application rate of 0.5L/ha, up to 3 applications/season at 14-21 day intervals. Application only by boom or hand held spray.

MANCOZEB

Trade Name Examples: Dithane Rainshield, Kotek, Ridomil Gold MZ WG, Supermanz, Promanz, Penncozeb DF, Manzeb, Manzate Evolution

Agrichemical Group: Dithiocarbamate

***FRAC (Fungicide Resistance Action Committee mode of action number):** M3

Registered on indoor tomato?: Yes

Witholding Period (days): 1, 2 or 3 days (depending upon product used)

Maximum Residue Limit (mg/kg): 7.00 {17} As carbon disulphide, for ethylenebis- or dimethyl- dithiocarbamates

Additional NZ EPA controls by trade name: Kotek: maximum application rate 40 L product/ha, maximum of 3 applications / year. Others No additional controls.

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

METALAXYL

Trade Name Examples: Phytospear, Speartek, Ventura

Agrichemical Group: Acylalanines

***FRAC (Fungicide Resistance Action Committee mode of action number):** 4

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.05 {75} Metalaxyl, sum of isomers, including metalaxyl-M (mefenoxam)

Additional NZ EPA controls by trade name: Ventura: maximum application rate of 1200 g ai/ha, 1 applictaion / season, OR 200 g ai/ha, a aximum of 3 applications / season, with a minimum of 10 days between applications. All others: No additional controls.

METALAXYL-M (Mefenoxam)

Trade Name Examples: Apron XL, Folio Gold, Ridomil Gold MZ WG, Ridomil Gold SL, Wakil XL

Agrichemical Group: Acylalanines

***FRAC (Fungicide Resistance Action Committee mode of action number):** 4

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 0.05 {75} Metalaxyl, sum of isomers, including metalaxyl-M (mefenoxam)

Additional NZ EPA controls by trade name: No additional controls

MINERAL OIL

Trade Name Examples: Excel Oil - Organic, DC-Tron Plus Organic, Organic JMS Stylet Oil, Enspray 99

Agrichemical Group: mineral oil

***FRAC (Fungicide Resistance Action Committee mode of action number):** NC: Not classified. Target site and code unknown.

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: EnSpray 99: The substance must be applied via ground-based methods only.

Caution: Can cause serious crop damage when used in greenhouses

MYCLOBUTANIL

Trade Name Examples: Validus 200EW

Agrichemical Group: Triazole

***FRAC (Fungicide Resistance Action Committee mode of action number):** 3

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: No additional controls

**REFER TO RESISTANCE MANAGEMENT (PAGE 5)*

PHOSPHOROUS ACID/ INORGANIC PHOSPHOROUS

Trade Name Examples: Agri-Fos 600, Foschek, Phosgard, Phostemic

Agrichemical Group: Inorganic phosphorus/ Inorganic

***FRAC (Fungicide Resistance Action Committee mode of action number):** P 07

Registered on indoor tomato?: No

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

POTASSIUM BICARBONATE

Trade Name Examples: Ecocarb, K-pow

Agrichemical Group: n/a

***FRAC (Fungicide Resistance Action Committee mode of action number):** n/a

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

PROCHLORAZ

Trade Name Examples: Curator, Mirage 450 Fungicide, Octave, Sportak EW, Varicur 450EW

Agrichemical Group: Imidazole

***FRAC (Fungicide Resistance Action Committee mode of action number):** 3

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Varicur 450EW: The maximum application rate of this substance is 1.5 L/ha (0.675 kg of prochloraz/ha), with a maximum application frequency of three times per season. Ground based application only. Curator: ground based application only.

Caution: Only prochloraz-Mn formulations can be used

PROCYMIDONE

Trade Name Examples: Sumisclex 500SC

Agrichemical Group: Dicarboximide

***FRAC (Fungicide Resistance Action Committee mode of action number):** 2

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 1.00

Additional NZ EPA controls by trade name: No additional controls

**REFER TO RESISTANCE MANAGEMENT (PAGE 5)*

PROPAMOCARB

Trade Name Examples: Proplant, Infinito, Previcur-N

Agrichemical Group: Carbamate

***FRAC (Fungicide Resistance Action Committee mode of action number):** 28

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Infinito: maximum applictaion rate 1.6L/ha, 3 applications / season.

PYRACLOSTROBIN

Trade Name Examples: Comet, Pristine

Agrichemical Group: Methoxy-carbamates

***FRAC (Fungicide Resistance Action Committee mode of action number):** 11

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Pristine: maximum application rate 1.6 kg product/ha, up to 4 applications / year. Comet: No additional controls.

PYRIMETHANIL

Trade Name Examples: Botrynil, Apex

Agrichemical Group: Anilinopyrimidine

***FRAC (Fungicide Resistance Action Committee mode of action number):** 9

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: No additional controls

Caution: Can cause leaf damage under humid conditions

SULPHUR

Trade Name Examples: Kumulus DF, Microthiol Disperss, Organic Super Sulphur, Thiovit Jet, Unishield, Cosavet, Carafe, Hortcare Sulphur, Hortcare Lime Sulphur, Grochem Lime Sulphur

Agrichemical Group: Sulphur compound

***FRAC (Fungicide Resistance Action Committee mode of action number):** M2

Registered on indoor tomato?: Yes - Vegetable claim for some products

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

THIOPHANATE-METHYL

Trade Name Examples: Taratek 5F, Topsin M-4A, Phartip plus

Agrichemical Group: Thiophanate

***FRAC (Fungicide Resistance Action Committee mode of action number):** 1

Registered on indoor tomato?: Yes

Witholding Period (days): 3 - 7 days (depending upon product used)

Maximum Residue Limit (mg/kg): 2.00 {101} Sum of benomyl and/or thiophanate methyl and carbendazim, expressed as carbendazim

Additional NZ EPA controls by trade name: No additional controls

Caution: Does kill natural enymies of Pythium when used via irrigation

THIRAM

Trade Name Examples: Thiram 40F, Thiram 80WDG

Agrichemical Group: Dithiocarbamate

***FRAC (Fungicide Resistance Action Committee mode of action number):** M3

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 7.00 {17} As carbon disulphide, for ethylenebis- or dimethyl- dithiocarbamates

Additional NZ EPA controls by trade name: Thiram 80 WDG: maximum application rate is 0.6 kg ai/ha, with a maximum of five applications per year and minimum interval of 7 days. Other - no additional controls.

TRIADIMENOL

Trade Name Examples: Citadel, Vandia 250EC

Agrichemical Group: Triazole

***FRAC (Fungicide Resistance Action Committee mode of action number):** 3

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: No additional controls

TRICHODERMA ATROVIRIDE

Trade Name Examples: Sentinel, Tenet, Unite

Agrichemical Group: Fungus

***FRAC (Fungicide Resistance Action Committee mode of action number):** BM 02

Registered on indoor tomato?: Yes

Witholding Period (days): Not required: WHP is not required as the active is exempt from MRLs

Maximum Residue Limit (mg/kg): Exempt: active is exempt from the requirements to set an MRL

Additional NZ EPA controls by trade name: No additional controls

REFER TO RESISTANCE MANAGEMENT (PAGE 5)

TRIFLOXYSTROBIN

Trade Name Examples: Luna Sensation, Flint

Agrichemical Group: Oximino-acetates

***FRAC (Fungicide Resistance Action Committee mode of action number):** 11

Registered on indoor tomato?: No

Witholding Period (days): Off-label: no WHP has been assessed

Maximum Residue Limit (mg/kg): 0.10

Additional NZ EPA controls by trade name: Luna Sensation: Maximum application rate 0.15L /ha, 2 applications / year, with a minimum 10 day interval between applications.

TRIFORINE

Trade Name Examples: Saprol

Agrichemical Group: Piperazines

***FRAC (Fungicide Resistance Action Committee mode of action number):** 3

Registered on indoor tomato?: Yes

Witholding Period (days): 3

Maximum Residue Limit (mg/kg): 2.00

Additional NZ EPA controls by trade name: No additional controls

**REFER TO RESISTANCE MANAGEMENT (PAGE 5)*

Fungicides Compatibility

Bumblebees

ACTIVE INGREDIENTS	IMPACT	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
AMETOCTRADIN			No
AZOXYSTROBIN	Cover		No
BACILLUS AMYLOLIQUEFACIENS BS1B			Yes
BACILLUS SUBTILIS	Cover	3 Days	No
BENZALKONIUM CHLORIDE			Yes
BOSCALID	No Action		No
BUPIRIMATE	Cover		No
CARBENDAZIM	Remove	1 Day	Yes
CHLORETHEPHON (see notes for chlorethephon)			Yes
CHLORINE DIOXIDE			Yes
CHLOROTHALONIL	Cover		Yes
COPPER HYDROXIDE	Remove	2 Days	Yes
COPPER OXIDE			Yes
COPPER OXYCHLORIDE	Cover		Yes
COPPER SULPHATE	Cover		No
CYPRODINIL	Cover		No
DIFENOCONAZOLE	No Action		No
DIMETHOMORPH	Remove	1 Day	No
FLUAZINAM			No
FLUDIOXONIL			No
FLUOPYRAM			Yes
IPRODIONE	Cover		Yes
KRESOXIM-METHYL	No Action		No
MANCOZEB	No Action		Yes
METALAXYL	No Action		No
METALAXYL-M (Mefenoxam)			Yes
MINERAL OIL	Remove	1 Day	No
MYCLOBUTANIL	No Action		No
PHOSPHOROUS ACID/ INORGANIC PHOSPHOROUS			No
POTASSIUM BICARBONATE	No Action		Yes
PROCHLORAZ			No
PROCYMIDONE	No Action		No
PROPAMOCARB			No
PYRACLOSTROBIN	Cover		No
PYRIMETHANIL	No Action		No
SULPHUR	No Action		Yes
THIOPHANATE-METHYL	No Action		Yes
THIRAM	No Action		Yes
TRIADIMENOL	No Action		No
TRICHODERMA ATROVIRIDE	No Action		Yes
TRIFLOXYSTROBIN	No Action		No
TRIFORINE	No Action		Yes

Fungicides Compatibility

Parasitoids

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
AMETOCTRADIN			No
AZOXYSTROBIN	Moderately harmful - 26 to 50% mortality	0 Weeks	No
BACILLUS AMYLOLIQUEFACIENS BS1B			Yes
BACILLUS SUBTILIS			No
BENZALKONIUM CHLORIDE			Yes
BOSCALID			No
BUPIRIMATE	Harmless - 0 to 25% mortality	0 Weeks	No
CARBENDAZIM	Harmless - 0 to 25% mortality	0 Weeks	Yes
CHLORETHEPHON (see notes for chlorethephon)			Yes
CHLORINE DIOXIDE			Yes
CHLOROTHALONIL	Harmless - 0 to 25% mortality	0 Weeks	Yes
COPPER HYDROXIDE			Yes
COPPER OXIDE			Yes
COPPER OXYCHLORIDE	Harmful - 51 to 75% mortality	<1 Week	Yes
COPPER SULPHATE			No
CYPRODINIL			No
DIFENOCONAZOLE	Harmless - 0 to 25% mortality	0 Weeks	No
DIMETHOMORPH			No
FLUAZINAM			No
FLUDIOXONIL	Harmless - 0 to 25% mortality		No
FLUOPYRAM	Harmless - 0 to 25% mortality		Yes
IPRODIONE	Harmless - 0 to 25% mortality		Yes
KRESOXIM-METHYL	Harmless - 0 to 25% mortality		No
MANCOZEB	Moderately harmful - 26 to 50% mortality	0 Weeks	Yes
METALAXYL	Harmless - 0 to 25% mortality		No
METALAXYL-M (Mefenoxam)	Harmless - 0 to 25% mortality		Yes
MINERAL OIL	Harmless - 0 to 25% mortality		No
MYCLOBUTANIL	Harmless - 0 to 25% mortality		No
PHOSPHOROUS ACID/ INORGANIC PHOSPHOROUS			No
POTASSIUM BICARBONATE			Yes
PROCHLORAZ	Harmless - 0 to 25% mortality	0 Weeks	No
PROCYMIDONE	Harmless - 0 to 25% mortality	0 Weeks	No
PROPAMOCARB			No
PYRACLOSTROBIN			No
PYRIMETHANIL	Harmless - 0 to 25% mortality		No
SULPHUR	Very harmful - 76 to 100% mortality		Yes
THIOPHANATE-METHYL	Very harmful - 76 to 100% mortality		Yes
THIRAM	Harmful - 51 to 75% mortality	1 Week	Yes
TRIADIMENOL	Harmless - 0 to 25% mortality	0 Weeks	No
TRICHODERMA ATROVIRIDE	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIFLOXYSTROBIN	Harmless - 0 to 25% mortality		No
TRIFORINE	Harmless - 0 to 25% mortality	0 Weeks	Yes

Fungicides Compatibility

Mirids

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
AMETOCTRADIN			No
AZOXYSTROBIN	Harmless - 0 to 25% mortality		No
BACILLUS AMYLOLIQUEFACIENS BS1B			Yes
BACILLUS SUBTILIS			No
BENZALKONIUM CHLORIDE			Yes
BOSCALID			No
BUPIRIMATE	Moderately harmful - 26 to 50% mortality	0 Weeks	No
CARBENDAZIM	Harmless - 0 to 25% mortality	0 Weeks	Yes
CHLORETHEPHON (see notes for chlorethephon)			Yes
CHLORINE DIOXIDE			Yes
CHLOROTHALONIL	Harmless - 0 to 25% mortality	0 Weeks	Yes
COPPER HYDROXIDE			Yes
COPPER OXIDE			Yes
COPPER OXYCHLORIDE	Harmless - 0 to 25% mortality	0 Weeks	Yes
COPPER SULPHATE			No
CYPRODINIL			No
DIFENOCONAZOLE	Harmless - 0 to 25% mortality		No
DIMETHOMORPH	Moderately harmful - 26 to 50% mortality		No
FLUAZINAM			No
FLUDIOXONIL			No
FLUOPYRAM	Harmless - 0 to 25% mortality		Yes
IPRODIONE	Harmless - 0 to 25% mortality		Yes
KRESOXIM-METHYL			No
MANCOZEB	Harmless - 0 to 25% mortality	0 Weeks	Yes
METALAXYL			No
METALAXYL-M (Mefenoxam)			Yes
MINERAL OIL	Very harmful - 76 to 100% mortality	1 Week	No
MYCLOBUTANIL	Harmless - 0 to 25% mortality	0 Weeks	No
PHOSPHOROUS ACID/ INORGANIC PHOSPHOROUS			No
POTASSIUM BICARBONATE			Yes
PROCHLORAZ			No
PROCYMIDONE	Harmless - 0 to 25% mortality	0 Weeks	No
PROPAMOCARB			No
PYRACLOSTROBIN			No
PYRIMETHANIL	Harmless - 0 to 25% mortality	0 Weeks	No
SULPHUR	Very harmful - 76 to 100% mortality		Yes
THIOPHANATE-METHYL	Harmless - 0 to 25% mortality	0 Weeks	Yes
THIRAM	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIADIMENOL			No
TRICHODERMA ATROVIRIDE	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIFLOXYSTROBIN	Harmless - 0 to 25% mortality		No
TRIFORINE	Harmless - 0 to 25% mortality	0 Weeks	Yes

DISCLAIMER: Every effort has been taken to provide accurate information in this resource but TNZ and ALT disclaim all liability in relation to the information it contains. Seek further advice from suitably qualified people before embarking on an IPM programme using beneficial insects.

Fungicides Compatibility

Lacewings

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
AMETOCTRADIN			No
AZOXYSTROBIN	Moderately harmful - 26 to 50% mortality	0 Weeks	No
BACILLUS AMYLOLIQUEFACIENS BS1B			Yes
BACILLUS SUBTILIS			No
BENZALKONIUM CHLORIDE			Yes
BOSCALID			No
BUPIRIMATE	Harmless - 0 to 25% mortality	0 Weeks	No
CARBENDAZIM	Harmless - 0 to 25% mortality	0 Weeks	Yes
CHLORETHEPHON (see notes for chlorethephon)			Yes
CHLORINE DIOXIDE			Yes
CHLOROTHALONIL	Harmless - 0 to 25% mortality	0 Weeks	Yes
COPPER HYDROXIDE			Yes
COPPER OXIDE			Yes
COPPER OXYCHLORIDE	Moderately harmful - 26 to 50% mortality		Yes
COPPER SULPHATE			No
CYPRODINIL			No
DIFENOCONAZOLE	Harmless - 0 to 25% mortality	0 Weeks	No
DIMETHOMORPH			No
FLUAZINAM			No
FLUDIOXONIL			No
FLUOPYRAM			Yes
IPRODIONE	Harmless - 0 to 25% mortality	0 Weeks	Yes
KRESOXIM-METHYL			No
MANCOZEB	Moderately harmful - 26 to 50% mortality		Yes
METALAXYL			No
METALAXYL-M (Mefenoxam)			Yes
MINERAL OIL	Harmless - 0 to 25% mortality	0 Weeks	No
MYCLOBUTANIL	Harmless - 0 to 25% mortality	0 Weeks	No
PHOSPHOROUS ACID/ INORGANIC PHOSPHOROUS			No
POTASSIUM BICARBONATE			Yes
PROCHLORAZ	Harmless - 0 to 25% mortality	0 Weeks	No
PROCYMIDONE	Harmless - 0 to 25% mortality	0 Weeks	No
PROPAMOCARB			No
PYRACLOSTROBIN			No
PYRIMETHANIL	Harmless - 0 to 25% mortality	0 Weeks	No
SULPHUR	Harmless - 0 to 25% mortality	0 Weeks	Yes
THIOPHANATE-METHYL	Harmless - 0 to 25% mortality	0 Weeks	Yes
THIRAM	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIADIMENOL	Harmless - 0 to 25% mortality	0 Weeks	No
TRICHODERMA ATROVIRIDE	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIFLOXYSTROBIN	Harmless - 0 to 25% mortality		No
TRIFORINE	Moderately harmful - 26 to 50% mortality	0 Weeks	Yes

Fungicides Compatibility

Mites

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
AMETOCTRADIN			No
AZOXYSTROBIN			No
BACILLUS AMYLOLIQUEFACIENS BS1B			Yes
BACILLUS SUBTILIS			No
BENZALKONIUM CHLORIDE			Yes
BOSCALID	Harmless - 0 to 25% mortality	0 Weeks	No
BUPIRIMATE	Harmless - 0 to 25% mortality	0 Weeks	No
CARBENDAZIM	Very harmful - 76 to 100% mortality		Yes
CHLORETHEPHON (see notes for chlorethephon)			Yes
CHLORINE DIOXIDE			Yes
CHLOROTHALONIL	Moderately harmful - 26 to 50% mortality		Yes
COPPER HYDROXIDE			Yes
COPPER OXIDE			Yes
COPPER OXYCHLORIDE	Harmless - 0 to 25% mortality	0 Weeks	Yes
COPPER SULPHATE			No
CYPRODINIL	Harmless - 0 to 25% mortality		No
DIFENOCONAZOLE	Moderately harmful - 26 to 50% mortality		No
DIMETHOMORPH			No
FLUAZINAM			No
FLUDIOXONIL			No
FLUOPYRAM	Harmless - 0 to 25% mortality		Yes
IPRODIONE	Harmless - 0 to 25% mortality	0 Weeks	Yes
KRESOXIM-METHYL	Harmless - 0 to 25% mortality	0 Weeks	No
MANCOZEB	Moderately harmful - 26 to 50% mortality		Yes
METALAXYL	Harmful - 51 to 75% mortality		No
METALAXYL-M (Mefenoxam)	Harmful - 51 to 75% mortality		Yes
MINERAL OIL	Harmful - 51 to 75% mortality		No
MYCLOBUTANIL	Harmless - 0 to 25% mortality	0 Weeks	No
PHOSPHOROUS ACID/ INORGANIC PHOSPHOROUS			No
POTASSIUM BICARBONATE			Yes
PROCHLORAZ	Moderately harmful - 26 to 50% mortality		No
PROCYMIDONE	Harmless - 0 to 25% mortality	0 Weeks	No
PROPAMOCARB	Harmless - 0 to 25% mortality	0 Weeks	No
PYRACLOSTROBIN			No
PYRIMETHANIL	Harmless - 0 to 25% mortality	0 Weeks	No
SULPHUR	Moderately harmful - 26 to 50% mortality		Yes
THIOPHANATE-METHYL	Harmful - 51 to 75% mortality	2-3 Weeks	Yes
THIRAM	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIADIMENOL	Harmless - 0 to 25% mortality	0 Weeks	No
TRICHODERMA ATROVIRIDE	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIFLOXYSTROBIN	Harmless - 0 to 25% mortality		No
TRIFORINE	Moderately harmful - 26 to 50% mortality	1 Week	Yes

DISCLAIMER: Every effort has been taken to provide accurate information in this resource but TNZ and ALT disclaim all liability in relation to the information it contains. Seek further advice from suitably qualified people before embarking on an IPM programme using beneficial insects.

Fungicides Compatibility

Pirate bugs

ACTIVE INGREDIENTS	BENEFICIAL INSECTS	PERSISTENCE	REGISTERED ON INDOOR TOMATO?
AMETOCTRADIN			No
AZOXYSTROBIN	Harmless - 0 to 25% mortality	0 Weeks	No
BACILLUS AMYLOLIQUEFACIENS BS1B			Yes
BACILLUS SUBTILIS			No
BENZALKONIUM CHLORIDE			Yes
BOSCALID			No
BUPIRIMATE	Moderately harmful - 26 to 50% mortality	0 Weeks	No
CARBENDAZIM	Harmless - 0 to 25% mortality	0 Weeks	Yes
CHLORETHEPHON (see notes for chlorethephon)			Yes
CHLORINE DIOXIDE			Yes
CHLOROTHALONIL	Harmless - 0 to 25% mortality	0 Weeks	Yes
COPPER HYDROXIDE			Yes
COPPER OXIDE			Yes
COPPER OXYCHLORIDE	Harmless - 0 to 25% mortality		Yes
COPPER SULPHATE			No
CYPRODINIL	Moderately harmful - 26 to 50% mortality		No
DIFENOCONAZOLE	Harmless - 0 to 25% mortality		No
DIMETHOMORPH	Harmful - 51 to 75% mortality		No
FLUAZINAM			No
FLUDIOXONIL	Harmless - 0 to 25% mortality	0 Weeks	No
FLUOPYRAM	Moderately harmful - 26 to 50% mortality		Yes
IPRODIONE	Harmless - 0 to 25% mortality	0 Weeks	Yes
KRESOXIM-METHYL	Harmless - 0 to 25% mortality	0 Weeks	No
MANCOZEB	Moderately harmful - 26 to 50% mortality		Yes
METALAXYL			No
METALAXYL-M (Mefenoxam)			Yes
MINERAL OIL	Harmful - 51 to 75% mortality	0 Weeks	No
MYCLOBUTANIL	Harmless - 0 to 25% mortality	0 Weeks	No
PHOSPHOROUS ACID/ INORGANIC PHOSPHOROUS			No
POTASSIUM BICARBONATE			Yes
PROCHLORAZ			No
PROCYMIDONE	Harmful - 51 to 75% mortality		No
PROPAMOCARB	Moderately harmful - 26 to 50% mortality		No
PYRACLOSTROBIN			No
PYRIMETHANIL	Harmless - 0 to 25% mortality	0 Weeks	No
SULPHUR	Moderately harmful - 26 to 50% mortality		Yes
THIOPHANATE-METHYL	Harmless - 0 to 25% mortality	0 Weeks	Yes
THIRAM	Moderately harmful - 26 to 50% mortality		Yes
TRIADIMENOL	Harmless - 0 to 25% mortality	0 Weeks	No
TRICHODERMA ATROVIRIDE	Harmless - 0 to 25% mortality	0 Weeks	Yes
TRIFLOXYSTROBIN	Moderately harmful - 26 to 50% mortality		No
TRIFORINE	Harmless - 0 to 25% mortality	0 Weeks	Yes

Notes

Notes

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