Department of
Primary Industries and
Regional Development

GOVERNMENT OF
WESTERN AUSTRALIA

Tomato potato psyllid

Chemical control results

Factsheet

About Tomato potato psyllid (TPP)

Tomato potato psyllid *(Bactericera cockerelli)* is a tiny sap-sucking insect which attacks a range of cultivated crops in the Solanaceae family including potato, tomato, eggplant, capsicum, chilli and tamarillo and weeds such as nightshade.

TPP damages plants by directly feeding on fruits with attached green material and leaves, and causes the disease psyllid yellows which can result in yellowing and stunting in tomato and potato plants.

TPP has also been identified as the vector of *Candidatus* Liberibacter solanacearum (CLso), the putative causal agent of Zebra Chip disease in potato. CLso has not been detected in Australia.

Chemical control

- In the USA, Mexico and NZ, chemical control is the most widely used technique to manage TPP/CLso.
- While conventional pesticides (all active ingredients other than biological pesticides and antimicrobial pesticides) may not kill TPP quickly enough to prevent CLso transmission, they may be useful for reducing the overall TPP population.
- A list of insecticides from different chemical classes have been identified for use in Australia, though are not currently registered specifically for control of TPP (Table 1). Note: some insecticides have been made available through emergency permits for use in host crops and nursery stock.

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TPP research and development

The Western Australian Department of Primary Industries and Regional Development has completed a series of laboratory and glasshouse trials on the performance of insecticides and Biological Control Agents (BCA) on TPP.

Further research is needed to validate preliminary findings and support registration of insecticides for control of TPP by the Agricultural Pesticides and Veterinary Medicines Authority.

Table 1: Insecticides with potential use against TPP. Refer to the legend below this table for further information on toxicity ratings.

Active ingredient (trade name)	**Product mode of action**
Methomyl 225g/L (e.g. Lannate)	1A; Acetylcholinesterase (AChE) inhibitors
Oxamyl (Vydate L)	1A, AChE inhibitors
Methidathion 400g/L (e.g. Suprathion)	1B; AChE inhibitors
Chlorpyrifos 500g/L (Chlorpyrifos 500EC)	1B; Anti-cholinesterase compound
Alpha-cypermethrin 100g/L–250g/L (e.g. Alpha 100 Duo, Nufarm Astound Duo, BASF Fastac)	3A; Synthetic pyrethroids
Bifenthrin 250g/L (e.g. Bifenthrin 250EC; Astral™ 250EC)	3A; Synthetic pyrethroids
Deltamethrin 27.5g/L (e.g. Cropro D-sect, Decis, Deltamethrin Duo)	3A; Synthetic pyrethroids
Lambda-cyhalothrin 250g/L (e.g. Karate Zeon®)	3A; Synthetic pyrethroids
Taufluvalinate 240g/L (e.g. Mavrik®, Klartan®)	3A; Synthetic pyrethroids
Deltamethrin 20g/L and thiacloprid 150g/L (Proteus®)	3A/4A; synthetic pyrethroid, noenicitinoid
Imidacloprid 200g/L (e.g. Confidor® 200SC, Imidacloprid 200SC)	4A; NACHR competitive modulator
Sulfoxaflor 240g/L (Transform™)	4C; NACHR competitive modulators
Spinetoram 120g/L (Success Neo™)	5; NACHR allosteric modulators
Abamectin 18g/L (e.g. Vertimec®)	6; Avermectins; Chloride channel activation
Pymetrozine	9B; Chordotonal organ TRPV channel modulators
Flonicamid 500g/kg (Mainman®)	9C; Chordotonal organ modulators — undefined target site
Buprofezin (Applaud®)	16; Inhibitors of chitin biosynthesis, type 1
Spirotetramat 240g/L (Movento 240SC)	23; Acetyl choline esterase carboxylase inhibition
Cyantraniliprole 100g/L (Benevia®)	28; Ryanodine receptor modulatior
Agri-50NF	UN; MoA unknown; derived from plant extracts
Azadirachtin 10g/L (AzaMax™)	UN; uncertain MoA unknown
Emulsifiable botanical oils 850g/L (Eco-Oil®)	UN; MoA unknown
Paraffinic oil 815 g/L (Sacoa BioPest)	UN; blocks spiracles; inhibits feeding

Toxicity rating to TPP
■ Low <25%; ■ Slightly toxic 26–50%; ■ Moderately toxic 51–74%; ■ Highly toxic >75%
↓ decreases egg laying; [1] up to 7 DAT; [2] up to 14 DAT
* toxic to beneficials, but has a short residual life

Registered use	Eggs	Nymphs	Adults	Translaminar activity	IPM compatible
Tomato, capsicum				N	N
Capsicum, sweet potato, tomato	Unknown			N	N
Fruits, vegetables				N	N
Fruits, vegetables				N	N
Tomato			Unknown	N	N
Tomato, capsicum			Unknown	N	N
Outdoor tomato, sweet potato			Unknown	N	N
Tomato, potato			Unknown	N	N
Tomato			Unknown	N	N
Potato	↓[1]	Unknown		N	N
Vegetables				Y	N
Fruits, vegetables	↓[1]			Y	Y (may be toxic to parasitic wasps)
Vegetables, ornamentals	↓[1]			Y	?
Fruits, vegetables	↓			Y	N
Capsicum, eggplant, potato, tomato	↓		Unknown	Y	Y (although may not be compatible with predatory bugs and mites)
Potatoes				Y	Y
Tomato, capsicum	Unknown		Unknown	N	Y (slightly toxic to parasitic wasp; highly toxic to some lady beetles species)
Vegetables	↓[2]			Y	Y
Potato, field tomatoes	↓[2]			Y	Y
Fruits, vegetables				N	Y
Fruits, vegetables				N	Y
Vegetables, ornamentals		?		N	*
Fruits				N	*

- Efficacy against TPP life stages has been indicated where information is available from published literature, or laboratory and glasshouse trials. Note that insecticides may not be effective against all life stages.
- Good insecticide coverage, or translaminar activity, is important as TPP are usually found on the underside of the leaves.
- Insecticides with translaminar activity are absorbed by one side of the leaf surface so that the active ingredient is available to the untreated side.

Insecticide resistance

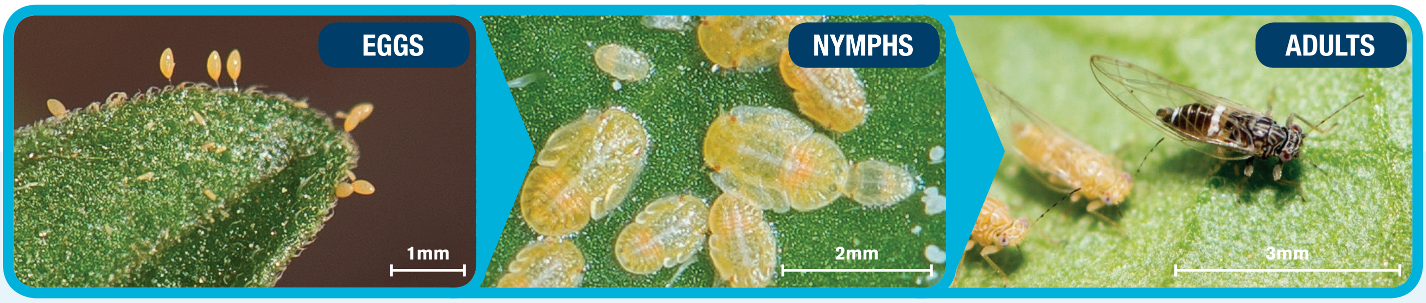
- Imidacloprid and abamectin are widely used to control TPP in potato and tomato crops in the USA and Mexico, with resistance in TPP populations observed in Texas and Mexico.
- Resistance to these insecticides was not observed in laboratory and glasshouse experiments in Western Australia.
- Apply at least two or three applications of each insecticide, 7–14 days apart to kill all the nymphs as most insecticides will not kill eggs.
- Follow the directions on the label.
- It is important to control psyllids on young plants as this stage is most affected by the psyllid yellows disease.
- Older plants are still vulnerable to infection by the bacterium, but the fruit that has set will still be harvestable.
- During the growing season, use insecticides from more than one insecticide group, always complete a cycle of applications with one insecticide before switching to another insecticide from a different chemical class.

Integrated Pest Management compatibility

- Many species of beneficial insects such as ladybird beetles, brown and green lacewings and hoverflies (syrphids) occur naturally.
- All are generalist predators and feed on a range of pests including aphids, whiteflies, thrips and caterpillars.
- Laboratory experiments indicate ladybird beetles and lacewings will also feed on TPP adults and nymphs.
- The compatibility of insecticides with potential use for TPP are indicated in Table 1. Note that the effect of insecticides can also vary with species and life stage.

Organically acceptable alternatives

- Azadirachtin, eco-oil, agri-50 and paraffinic oil are available commercially and have activity against TPP.
- Azadiractin was very toxic to TPP adults, paraffinic oil, agri-50 and eco-oil in potato and capsicum were less toxic to TPP adults.
- Azadirachtin, eco-oil, agri-50 and paraffinic oil were least toxic to mature nymphs (3rd-5th instar).
- Egg laying was observed with azadirachtin, agri-50, eco-oil, and paraffinic oil, though none hatched after 7 days.



Visit **agric.wa.gov.au/tpp** for more information on the signs and symptoms of TPP.

This factsheet is an initiative of the national TPP Transition to Management Plan.

STOP. CHECK. PROTECT.

Help limit the spread of the Tomato potato psyllid

agric.wa.gov.au/tpp