



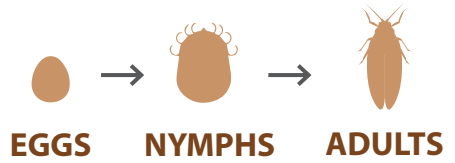
TOMATO POTATO PSYLLID

(Bactericera cockerelli)

TOMATO POTATO PSYLLID (*Bactericera cockerelli*)



TPP is a tiny sap-sucking insect with three lifecycle stages:



All stages are very small (less than 3mm) but can be seen with the naked eye.



Pest of tomatoes, potatoes, capsicums, tamarillos, and other solanaceous crops. The insect can also complete its lifecycle on kūmara (sweet potato).



Transmits the bacterial pathogen *Candidatus Liberibacter solanacearum*, haplotype A, which infects solanaceous host plants. Other haplotypes infect plants in other plant species (e.g. carrots, nettles) and are transmitted by other psyllid species. Only haplotype A is present in New Zealand.



Location is widespread and established throughout New Zealand.



Dark coloured mature adult psyllid (right) and pale, newly emerged adult psyllid (left).

ADULTS

Tomato potato psyllid adults have transparent wings, are approx. 3mm long and resemble tiny cicadas.

Adult psyllids change colour as they age, changing from light yellow when newly emerged, to grey/black after about five days. Mature adults have a white stripe on their abdomen. Adult psyllids fly quickly when disturbed, and can be detected on yellow sticky traps. Adults and nymphs are plant feeders that suck plant sap. Tomato potato psyllid transmits the bacterial pathogen *Candidatus Liberibacter solanacearum*.

Psyllid yellows as observed in the USA have not been observed in NZ, possibly because of the psyllid genotype present in NZ, which is only one of the many tomato potato psyllid genotypes present in the USA.



Tomato potato psyllid nymphs showing the diversity of colours ranging from green, to yellow, to reddish-brown.

NYPHS

Tomato potato psyllid nymphs are approx. 2 mm long and generally found feeding on the underside of leaves. They may be confused with scale insects or white fly nymphs. Tomato potato psyllid nymphs will move if disturbed and are flat. When examined under a microscope a fringe of soft spines is visible around the edge of the nymph.

Psyllid nymphs and adults secrete a granular, sugar-like substance called psyllid sugars which sticks to the leaves and grow black sooty mould. Plants may be sticky and have a dirty appearance.

Nymphs can also transmit the bacterial pathogen *Candidatus Liberibacter solanacearum*.

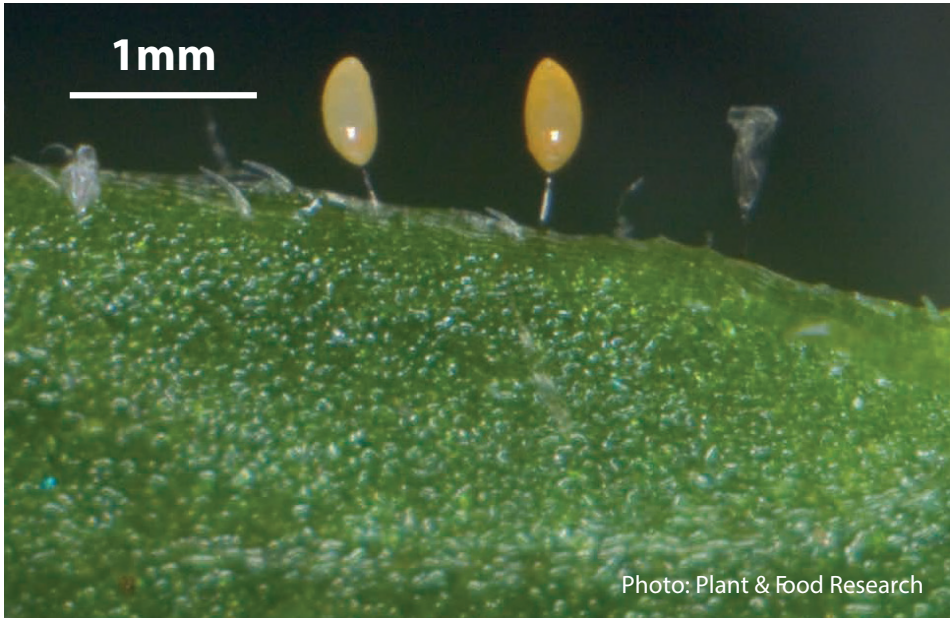


Photo: Plant & Food Research

Close-up of two psyllid eggs attached by a stalk to a plant leaf, with empty clear egg shells on either side

EGGS

Eggs of the tomato potato psyllid are attached to the leaf by a short stalk, and are often laid along the leaf edges.

Eggs are oblong in shape and are a shiny yellow colour. As the embryo develops, they become orange coloured.

Female psyllids can lay up to 500 eggs over their lifetime, with the life cycle completed in around four weeks.

Psyllid numbers can increase rapidly in warm conditions.



Psyllid eggs attached to the edge of a tomato leaf



Tomato leaves covered in psyllid sugars excreted by psyllid nymphs and adults



*Symptoms of *Candidatus Liberibacter solanacearum* infection visible as leaf curling and yellowing leaves on a greenhouse tomato plant*

SYMPTOMS

Nymphs and adults secrete psyllid sugars while feeding. A small number of them can produce a large amount of psyllid sugars. Psyllid sugars can be an obvious sign of infestation, and may occur well before any symptoms can be seen.

First symptoms of an infection by *Candidatus Liberibacter solanacearum* are yellowing of the edges of young leaves together with an upward cupping of the leaves which becomes more obvious with time. Leaves can develop dead patches, stem elongation may be reduced, and plant growth stunted.



Early season foliar symptoms in potato related to infection by Candidatus Liberibacter solanacearum displaying mainly as yellowing of the leaf margins and cupping of the leaves.

SYMPTOMS IN POTATOES

Potatoes infected with *Candidatus Liberibacter solanacearum* may also produce small misshapen tubers and aerial tubers. Internal tuber browning also occurs which darkens on frying. This is commonly called Zebra chip disease.

Candidatus Liberibacter solanacearum is transmitted by tomato potato psyllid adults and nymphs.

Identifying an infection with *Candidatus Liberibacter solanacearum* is a matter of elimination, as other biotic and abiotic stresses can cause similar symptoms (e.g. *Rhizoctonia*, *Verticillium*, drought).

To manage tomato potato psyllid on potatoes, refer to the "Tomato Potato Psyllid Control" chart for a list of crop protection products registered for use on potatoes.

Photographs: Plant & Food Research



*Later season foliar symptoms in potato related to infection by *Candidatus Liberibacter solanacearum* displaying as purpling of the leaves, thickening of nodes, and presence of aerial tubers.*



*Fresh potato tubers with Zebra chip disease symptoms caused by *Candidatus Liberibacter solanacearum*.*



Tamarixia triozae adult.



Tamarixia triozae adult parasitising a tomato potato psyllid nymph.

TAMARIXIA TRIOZAE - BIOLOGICAL CONTROL AGENT

Tamarixia triozae is a parasitic wasp and a biological control agent for tomato potato psyllid. It has a black body, transparent wings, red eyes and yellow/black bands on its legs. It is approx. 3 mm long.

Tamarixia adults parasitise and feed on psyllid nymphs. Female *Tamarixia* adults lay a single egg on the underside of a psyllid nymph, between the nymph and the leaf. Signs of parasitism are crispy brown/beige nymphs with holes or dark areas near the head where the wasp has emerged.

Tamarixia triozae can be used alongside other beneficial predators such as hoverflies, ladybirds and lacewings as part of an integrated pest management programme.

Photographs: Plant & Food Research



*Psyllid nymphs parasitized by the parasitic wasp *Tamarixia triozae* showing the crispy brown/beige colouring and the hole near the head of the nymph where the new adult wasp has emerged.*



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