

# CITIZEN SCIENCE SUPPORTING TPP SURVEILLANCE



With the help of hundreds of volunteer gardeners from across Australia, a Hort Innovation project to survey TPP is coming to an end. More than 1800 traps were assessed in each state with no TPP detected outside of WA. By Paulette Baumgartl.

Tomato potato psyllid (TPP) has been established in New Zealand for over 15 years, where it is a major pest. In 2015 a quarantine survey discovered it in Australia's most easterly outpost, Norfolk Island, with the tiny insect detected in Western Australia only two years later (February 2017). This discovery triggered a major emergency response, including a survey of the entire country for the presence of this pest.

TPP carries the bacterium *Candidatus Liberibacter solanacearum* (CLso), a disease of solanaceous plants which can be particularly destructive to the potato industry. The disease is characterised by curled leaves, yellow brown splotches, and a slight purple tinge to the growing tips. Plants shrivel, die early, and yield small tubers which, when fried, are stripy and unpalatable (hence the nickname zebra chip).

## SURVEYING AUSTRALIA FOR THE PRESENCE OF TPP

TPP was initially detected in a seemingly innocent back yard vegetable patch in Perth. Primary industry agencies around Australia collaborated with the West Australian Department of Primary Industries and Regional Development (DPIRD) to help monitor and manage this pest.

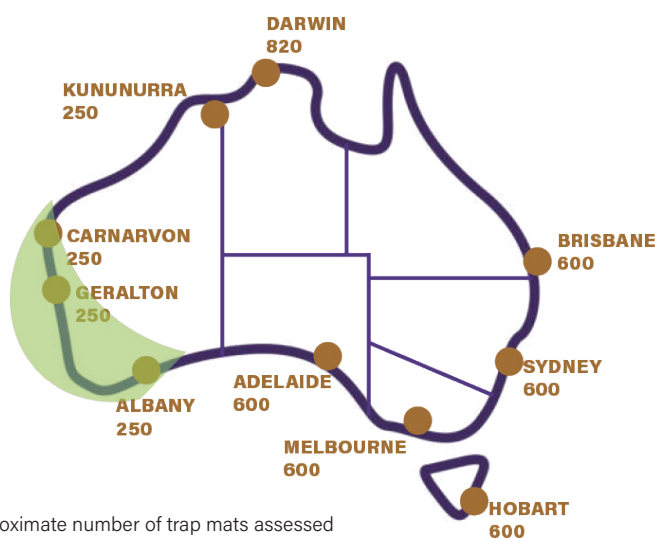
In 2019 Hort Innovation initiated a 3 year National surveillance project for both the psyllid and the CLso bacterium it could potentially vector (MT18008).

Tasked with the early detection of TPP, and testing for the presence of CLso in trapped TPP specimens, the project leaders put out a call for volunteers.

Due to the likelihood of the pest first occurring in urban areas, activities focussed on capital cities and their peri urban fringes of the capital cities, except in WA, where regional centres were targeted. Local agencies used social media to advertise the project and attract participants.

### KEY POINTS

- No reported cases of infection by the *Candidatus Liberibacter solanacearum* (CLso) bacterium occurred in Australia
- Nearly 14,500 traps were set across Australia over the course of three years
- Thousands of volunteers participated in the program, across Australian capital cities and regional WA
- Almost 6,000 TPP specimens were tested for the presence of CLso in WA



**Figure 1.** Approximate number of trap mats assessed per year in each major city. N.B. surveillance in Albany, Geraldton and Carnarvon only occurred during season 1. Current range of TPP shown in green

The program, known as 'Adopt a trap' ran all across the country except in the ACT.

Each participant received a trapping kit, which included all materials, instructions, ID stickers, a tomato (host) plant, and return details.

Participants from most states were also asked to monitor their activities via the MyPestGuide app.

With privacy measures in place, the app gave project leaders some oversight, allowing them to verify location and that the volunteers were following correct trapping procedures. This ensured the project retained scientific rigor.

In most states, trapping for the 3 year project concluded in Autumn 2022. However the program will continue in the Northern Territory until the end of this year (2022). More than 1,800 traps have been returned and assessed per state (Figure 1), with no TPP found outside the Western Australian southwest and Gascoyne regions.

Returned traps are assessed under a microscope with all psyllids examined, identified and counted. Any TPP

found are circled, and a sample (10-20 individuals per trap) are extracted for analysis of the presence of CLso molecular markers.

The Kimberley in northern WA remains free of TPP, with no specimens found in Kununurra. However, surveillance did detect TPP in Carnarvon, Geraldton and Albany.

Since the first identification of TPP in Perth in 2017, thousands of individual TPP have been analysed for CLso every spring and summer. The bacterium has never been detected. It is concluded that TPP arrived in Australia without bringing the bacterium with it, so mainland Australia is currently CLso free.

### HOW TO TEST FOR TPP IN MY CROP

Addressing the R&D forum in Ballarat, Victorian project co-ordinator and diagnostic entomologist Cait Selleck from Agriculture Victoria summarised some of the project findings and what to look out for if you are concerned about TPP on your own farm.

"Visual inspections can be difficult due to the very small size of the insects,

however, generally, adults, eggs and nymphs can often be found together on the underside of a leaf," Cait said (Figure 2).

"Another indicator is a pretty dusting of what looks like icing sugar, but is actually psyllid excrement, often referred to as honey dew" (Figure 3).

Cait is one of many entomologists from around Australia who spend hours looking down a microscope hoping not to find a TPP specimen.

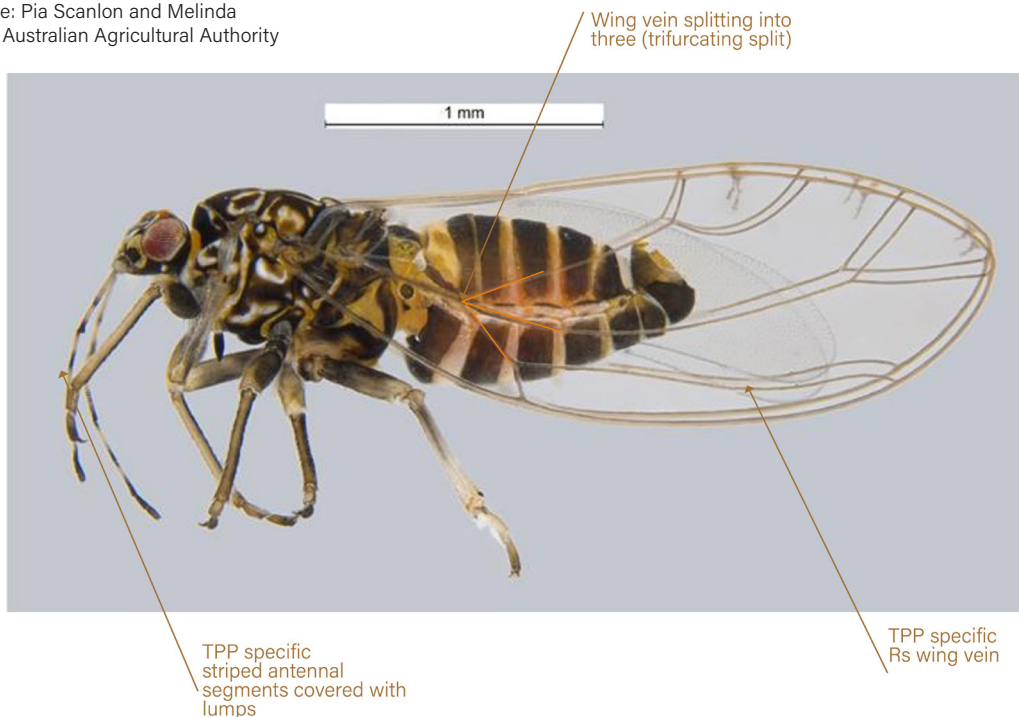
"It is a highly manual process; real people spend hours examining the traps to inspect every psyllid," Cait explained.

"TPP itself has some clear identifying features, making it easy to spot under a microscope, including characteristic veins on its wings (Figure 4 and 5)."

Cait adds that the best way to determine whether TPP is present is with a sticky trap, readily available at a garden or hardware store. It is highly recommended to use the trap with a cage to reduce the risk of vertebrate by-trap.

"It is important to remove the trap after one week" suggests Cait, "this is

**Figure 5.** Characteristic features of TPP.  
Source: Source: Pia Scanlon and Melinda Moir, Western Australian Agricultural Authority



enough time to detect whether TPP is present in the crop. In any case, any longer and the trapped insects start to degrade, making correct identification difficult. "

The trap should be mounted on a stake or with a bulldog clip to a fence or similar.

As TPP prefer an ambient temperature of 26 degrees, the best time to set out traps is during the growing season for northern Australia (May to August), summer in Tasmania, and spring and autumn everywhere else.

Traps are best placed in a transparent plastic covering, before posting to the relevant agency.

Check the websites for each state to check their protocols before sampling and sending.

You can learn more about TPP and zebra chip through the PotatoLink webinar on this topic presented by Dr Melinda Moir (DPIRD) and John Jackson (Potatoes New Zealand).

View at [potatolink.com.au/webinars](http://potatolink.com.au/webinars).



**Right, from top to bottom:**

**Figure 2.** Community of TPP eggs, nymphs and adults. Source: Pia Scanlon, Western Australian Agricultural Authority

**Figure 3.** 'Honey dew', characteristic icing sugar appearance of TPP nymph excrement. Source: Pia Scanlon, Western Australian Agricultural Authority

**Figure 4:** Adult TPP. Source: Pia Scanlon, Western Australian Agricultural Authority

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