Hort Innovation

Final Report

Monitoring psyllids and psyllid predators in Australian potato crops

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EXECUTIVE SUMMARY

Zebra chip disease, caused by *Candidatus* Liberibacter psyllaurous and vectored by the Tomato/Potato Psyllid (TPP), *Bactericera cockerelli*, is a devastating disease of potato and other Solanaceous crops. Its discovery in New Zealand in 2006 and subsequent spread throughout that country with associated major crop losses prompted significant industry concerns. In April 2014, *B. cockerelli* and '*Ca*. L. solanacearum' were reported on Norfolk Island, further raising concerns that the pest complex could reach the Australian mainland. In February 2017, TPP was reported infesting plants in gardens and commercial glasshouses in the Perth metropolitan area, Western Australia. Subsequent surveys found that the psyllid was also present in regional areas outside Perth and it is now suspected that this pest may have been in WA for two or more years. Fortunately, to date, none of the WA psyllids have been found to be infected with the bacterium '*Ca*. L. solanacearum'.

This project maintained a psyllid and psyllid predator trapping program across major production areas of eastern Australia for three consecutive cropping seasons (2014/15, 2015/16 and 2016/17). It also produced and disseminated industry relevant information to assist in recognition of the pest and damage it causes, and provided advice on action to be taken if suspect symptoms were seen and updates on the trapping program. The project was initiated as a continuation of PT10001 (Native Psyllid populations and the distribution of *Candidatus phytoplasma australiense*). A network of yellow sticky traps was established in the major potato growing regions of eastern Australia to act as an early warning system to detect incursions of TPP. Over the duration of the project, more than 1,200 traps were placed in potato growing regions of Tasmania, Victoria, South Australia, New South Wales and Queensland (Appendix 1). No tomato potato psyllids were detected but over 6,400 native psyllids were trapped. Over 3,815 beneficials (potential predators of TPP) were caught, mainly brown lacewings, hoverflies and ladybirds. Both the number of native psyllids and beneficials caught varied considerably between potato growing regions and time of year. As in the previous project, less than 0.3% of psyllids caught belonged to the same family as TPP (Triozidae). This allowed the rapid differentiation of the majority of trapped psyllids from TPP based on the easily discernible pattern of wing venation. The most prevalent psyllid genera caught were *Ctenarytiana* and *Acizzia*. Other genera less frequently caught included *Creiis*, *Cardiaspina*, *Anoeconeossa*, *Euclyptolyma*, *Phyllolyma*, *Phellopsylla*, *Blastopsylla* and *Cryptoneosea/Ageteopsylla*. Nearly all psyllids caught were associated with nearby vegetation, particularly *Eucalyptus* spp., and would therefore, be unlikely to feed on potato plants and transmit the Liberibacter if was to enter Australia.

A web site for the project was created in 2014 (http://www.utas.edu.au/tia/centres/vegetables/monitoring-psyllids-and-psyllid-predators-in-australian-potato-crops) to provide updates on the trapping results. On this web site, a pictorial key for the identification of TPP, using a 3-D model of the adult, was also created based on a descriptive key published by DAFF (2012).

A yellow sticky trap placed in a potato field to monitor for incursions of the tomato potato psyllid.

Over the course of the project, several workshops for potato growers and industry stakeholders were held on psyllid identification and recognition of Liberibacter/ Phytoplasma infestations in potato crops to ensure that, if incursions do occur, they are detected as early as possible in order to limit their impact. With the detection of TPP in WA, extra funding from Hort Innovation was obtained to employ a national psyllid co-ordinator as part of this project for 3 months. In April 2017, Raylea Rowbottom was employed by TIA to fulfil this role. Through the appointment of Raylea, considerable liaison between TIA and various State Biosecurity counterparts has been accomplished in a short time frame in order to align TPP surveillance efforts to guarantee State level requirements for an Area of Freedom certificate. In Tasmania, several meetings were held with the state's Department of Primary Industries, Water and the Environment (DPIPWE) Plant Biosecurity & Diagnostics Branch, including the Chief Plant Health Officer, to combine surveillance efforts and to establish protocols. It was agreed that TIA will undertake extra TPP surveillance to include tomatoes as well as potatoes while DPIPWE will undertake surveillance of "high risk nodes" such as nurseries, community gardens and transport depots. TIA have adopted current surveillance reporting systems to comply with DPIPWE surveillance protocols and National Minimum Data Standards (NMDS) requirements so that future data collection will complement State level reporting. An additional meeting for industry stakeholders was organised by TIA at the Forthside Research Station in June 2017 to provide training in TPP identification, give updates on TPP in WA, present a new reporting tool (MyPestGuide App) and discuss surveillance protocols for the 2017/18 season. A wide range of stakeholders attended the meeting and several expressed a willingness to be involved in future TPP surveillance. A 'surveillance pack' (consisting of sticky traps and envelopes for posting traps back to TIA) was made available to participants and displays of native psyllids and TPP were shown. A pocket monitoring guide for the identification of TPP was produced by TIA was distributed at the meeting. In Victoria, discussions were held with the Department of Economic Development, Jobs, Transport and Resources Surveillance and Preparedness officer and the Chief Plant Health Officer to collaborate surveillance efforts across the State. In June 2017, Paul Walker and Raylea Rowbottom attended the Processing Tomato R & D Conference in Echuca to present information on TPP and CLso identification, biology, distribution and mechanisms of spread. In South Australia, discussions have been held with the manager of Plant Health Operations, PIRSA. In July 2017, Raylea attended a TPP training workshop aimed at potato and tomato growers

held in Virginia, SA where she presented information on TPP identification, surveillance and reporting. Handouts, including a summary of discussion points from the presentation and a pocket monitoring guide for identification of TPP, were given out as well as presenting displays of native psyllids and TPP. Collaboration with Calum Fletcher (Biosecurity Coordinator of AUSVEG) resulted in his presence at this workshop to present key biosecurity issues and provide an open discussion via teleconference with a New Zealand farmer who has experienced TPP first hand. In Queensland, collaboration with Biosecurity at QDAF is underway and a TPP identification training session has been proposed to be held in late July/August.

Appendix 1

Table 1: Summary of 2014/15 trapping results

Region	Trapping period	Total no. traps	Total no. psyllids	Mean no. psyllids/trap	Total no. beneficials	Mean no. beneficials/trap
Tasmania northern	July-14-Apr-15	204	2561	12.6	457	2.2
Tasmania eastern	Oct-14-Apr-15	76	205	2.7	318	4.2
Victoria	Nov-14-Feb-15	39	244	6.3	149	3.8
South Australia	Oct-14-May-15	61	473	7.8	76	1.2
Qld	Jul-14-Sept-15	21	68	3.2	78	3.7
NSW	Dec-14-Jan-15	6	1	0.2	2	0.3
All		**407**	**3552**	**8.7**	**1080**	**2.7**

Table 2: Summary of 2015/16 trapping results

Region	Trapping period	Total no. traps	Total no. psyllids	Mean no. psyllids/trap	Total no. beneficials	Mean no. beneficials/trap
Tasmania northern	July-15-May-16	180	843	4.7	585	3.3
Tasmania eastern	Aug-15-May-16	74	226	3.1	231	3.1
Victoria	Dec-15-Jan-16	18	100	5.6	160	8.9
South Australia	Oct-15-Mar-16	53	584	11.0	390	7.4
All		**325**	**1753**	**5.4**	**1366**	**4.2**

Table 3: Summary of 2016/17 trapping results

Region	Trapping period	Total no. traps	Total no. psyllids	Mean no. psyllids/trap	Total no. beneficials	Mean no. beneficials/trap
Tasmania northern	July-16-May-17	376	1486	4.0	859	2.3
Tasmania eastern	Aug-16-May-17	77	401	5.2	342	4.4
Victoria	Dec-16-Mar-17	76	421	5.5	151	2.0
South Australia	Sept-16-Feb-17	9	7	0.8	6	0.7
Queensland	June-16-Aug-16	8	44	5.5	11	1.4
All		**546**	**1187**	**4.3**	**1369**	**2.5**