

Towards developing an IPM programme for potatoes in New Zealand; the role of natural enemies

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Recent initiatives to develop IPM for potato crops focussed mainly on controlling aphid pests as virus vectors and managing potato tuber moth (PTM) in the warmer regions of New Zealand. Research on PTM focussed on movement of moths, both as a crop monitoring tool, but also for resistance management. Proposals included a classical biological control (CBC) project for PTM, to assess *Orgilus lepidus* either to complement or replace the existing parasitoid, *Cotesia subandinus*. In 2008, we reported high levels of resistance in PTM populations from the Pukekohe and Waikato regions to pyrethroid and organo-phosphate insecticides, giving impetus to improving biological control and developing IPM tools, particularly for PTM. However, the arrival of tomato-potato psyllid (TPP) relegated prospects of CBC for other potato pests to a low priority compared with urgently required management tools for TPP. Research on CBC was redirected to assess existing biological control agents (BCAs) and their impact on pests, initially in the Pukekohe region. To date, two years of weekly monitoring and spring and summer field trials show that there are existing BCAs that give substantial control of all pests in potatoes. In particular, brown lacewing, small hover fly (*Melanostoma fasciatum*) and spiders can control aphids, exposed caterpillar pests and TPP for 8 months of the year. However, two summer generations of TPP from January to April cause major crop losses. Lower populations of TPP in cooler regions provide an opportunity for naturally occurring BCAs to give longer-lasting control of TPP. Laboratory choice and no-choice studies indicate that all life-stages of the common predators, brown lacewing, small hover fly, 11-spotted ladybird and nabids are capable of consuming all life stages, and that they consume large numbers of TPP. The potato industry urgently requires sound insecticide resistance management (IRM) strategies, compatible insecticides for managing resistance, selective insecticides for maximising BCAs, plus other robust IPM tools for sustainable production of potatoes, particularly for the longer (warmer) growing regions.

