

PEST MANAGEMENT IN POTATOES

By Dr Paul Horne

Dr Paul Horne is well known to many as the Director of IPM Technologies. His 5-year project “An IPM extension project for the potato and onion industries” has supported growers adopting IPM on farm, improving their pest management while reducing chemical use and costs. Now at its conclusion, Paul reflects on successful implementation of IPM on potato farms.

POTATO PESTS

Each agricultural crop has its own set of pests and potatoes are no different. The range of pests that Australian growers deal with varies a little between regions, but there are some that most have in common.

The main pest species in Australia are potato tuber moth and various aphids (as potential vectors of virus). Caterpillar species such as loopers and *Helicoverpa* species can also be important, while several species of thrips are potential vectors of tomato spotted wilt virus (note that the seasonally abundant plague thrips does not vector TSWV). Soil-dwelling pests such as the larvae of African black beetle, whitefringed weevil and potato wireworm are very important in a few regions but absent in others.

The importance of these pests not only varies in importance by region but also by crop type. For example, aphids are of most concern to seed growers, while potato tuber moth is more important for growers wanting to harvest high-setting varieties in mid-summer. Thrips and TSWV are a concern in a few localities, where there are reservoirs of both the virus and species of thrips that vector it (particularly tomato thrips and onion thrips).

PEST CONTROL

So, what are the options for control of these pests, in whatever combination

they occur? As with any crop, growers have three categories of options to select from:

- Biological controls (predators and parasitoids of the pests)
- Cultural controls (management methods that help encourage beneficial species or discourage pest populations)
- Pesticides

wasps, brown lacewings, hoverflies, ladybird beetles and damsel bugs. They are particularly effective in providing a high level of control of these key pests, although at times they need some extra support from cultural and pesticide controls. These beneficial species occur naturally in all potato growing regions of Australia. They can reach extremely high levels in potato crops so long as broad-



Figure 1. Brown lacewing adult and larva (Photos IPM Technologies)

If growers choose to use all three in a compatible way, then that is integrated pest management (IPM).

Each species of pest has other insects that attack it. Some are extremely effective and can be relied upon to give substantial levels of control. Predators and parasitoids of aphids and potato moth include parasitoid

“We started using IPM just a few years ago, and now we are seeing much better control of potato moth and aphids. Our use of insecticides is much more precise and effective.”

- Ben Hotchkin, Thorpdale, Victoria



Figure 2. Hoverfly adult and larva (Photos IPM Technologies)

spectrum insecticides are not applied. Pest thrips are attacked by other species of thrips, true bugs, mites and beetles.

However, it is more difficult to manage soil dwellers such as beetle larvae and wireworms. There are no really effective biological controls, so other techniques are needed – such as cultural controls.

Some cultural control measures are extremely important for reducing damage by insect pests. For example, certified seed, weed control (including control of self-sowns), rotation and isolation reduce the risk of virus transmission.

Potato tuber moth damage to the tubers can be reduced by ensuring there is fine soil tilth and large hills, rolling and using overhead irrigation.

Variety selection, time of planting and harvest can also help manage a range of pests and insect vectored diseases.

The third and final method of controlling pests is using chemical pesticides. Applying broad-spectrum insecticides before or immediately

“We first met Paul and his team at a conference down south. At the time, pest numbers in the potatoes were un-manageable. We attended one of the workshops Paul and Angelica ran in the Lockyer and then they visited us on our farm to talk to us about our own pest management program. Since then, we have totally changed our approach to pest management. We have gone from a situation where pest numbers were out of control to now, where we are flat-out finding a pest in the crop. Our total pesticide usage is maybe 5% of what it was. And our agronomist tells us he feels sorry for all the beneficial insects in the crop because there is nothing for them to eat.”

- Kerry Hauser, Hauser Farms, Lockyer Valley Qld

after planting will not usually reduce the impact of the beneficial species described above, as they will fly into crops only after they emerge.

However, application of these products to growing foliage will severely disrupt populations of beneficial species. This can induce ‘pest flare’, where populations of a particular pest (e.g. aphids) increases dramatically in the absence of competitors and predators.

Broad-spectrum insecticides can also be applied without disrupting beneficial species if sprayed at or after crop senescence (or when applying a herbicide to kill the plants).

However, if selective products are applied (e.g. for caterpillars or aphids) then the beneficial species and pesticides can work together, giving better control than either on their own. This is the “integrated” part of integrated pest management.

Over the last few years many growers around the country have switched to using IPM rather than relying on insecticide applications alone. Some have already told this story through articles in Potatoes Australia e.g. Victorian grower Wayne Tymensen

[February/ March 2019], South Australian grower Pat Virgara [“Grower Success Stories” January 2019] and Kangaroo Island seed grower Peter Cooper [June/July 2017].

With few new chemicals coming on the market, increasing legal restrictions and costs associated with the ones still registered, and development of resistance among key pests, it makes sense to use all the tools in the toolbox – and that means IPM.

“The impression I get speaking to potato growers in my region is that they are comfortable with how they are managing pests in potatoes. Most of them are familiar with the IPM Technologies approach to pest management and have adopted this style of management for a number of years now. The impression I get is that pest management is “old hat” to them now – they don’t view insect pests as a major problem anymore and they attribute this to the practice changes they have made through involvement in this project.”

- Zara Hall, Industry Development Officer Southern Queensland

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