

# VG16067: Impact of pesticides on beneficial arthropods of importance in Australian vegetable production

## Facilitators

Project VG16067 was a collaboration between the Department of Agriculture and Fisheries, Queensland; the South Australian Research and Development Institute; and IPM Technologies.

## Major findings

Project VG16067 developed a series of crop-specific guides for growers and advisors wanting to use or give advice on integrated pest management (IPM). These guides focus particularly on the impact of pesticides on beneficial species present in Australia.

Seven crop-specific guides were developed. These were for brassicas, cucurbits and fruiting vegetables; leafy vegetables and head lettuce; legume vegetables; root and tuber vegetables; stalk and stem vegetables; and sweet corn.

“From the outset, the aim of the project was to present the information in a way that is clear, concise and practical for the target audience,” Project Lead and entomologist Jessica Page explained.

“The guides contain information on the beneficials relevant to the crop type and only for the products with a current registration in that crop.”

Presented in the guides is the mortality of each species on a sliding scale from zero to 100 per cent, shown for each active ingredient. The same information is also presented by trade name.

“The aim of the guides was not to create a list of good/bad or safe/not safe products, but was instead to show a relative ranking of products. The guides are meant to be used as a tool for making more informed decisions on pesticide use within an IPM strategy,” Page said.

“There are many pesticides available now that are IPM compatible, in that they are not broad-spectrum products that

wipe out all beneficial species – but this doesn’t necessarily mean they are safe to everything.”

“It’s mainly these products that we were interested in testing, because the effects on beneficial species can vary a lot. The same product could be completely safe to use in one crop, but highly disruptive in another depending on which beneficial species are important.”

The guides are there to provide this information on the range of toxicity to beneficials so that informed decisions can be made on how to get the best out of selective IPM compatible products by using them to support biological control; and when the only option is to use a product that is toxic to beneficials it helps to know what the potential consequences might be.

“Using IPM is often considered more difficult than using a spray program and, for this reason, it often ends up being used only as a last resort. These guides are there to help make IPM easy; they tell you which beneficials are important in each crop, what they look like and how to choose products with the least impact. I highly recommend any vegetable grower interested in using IPM to download the guides from the AUSVEG website,” Page said.

## Background

Prior to this research, most of the information available was produced overseas. Because the beneficial species present in Australia are different to those in other parts of the world, new research was needed to provide information for Australian growers.

“From working with growers and agronomists for many years, it became clear that one of the biggest challenges for using IPM successfully is understanding

the effects that pesticides can have on beneficial species. Some of this information is available from overseas, but it is mainly produced for protected cropping and includes beneficial species that are not present in Australia,” Page said.

“The information from overseas is also presented in a way that is not readily accessible for Australian growers and advisors wanting to make a quick decision on which product to use. So, this project was undertaken to address this issue.”

The project was a three-year collaboration between the Department of Agriculture and Fisheries, Queensland; the South Australian Research and Development Institute; and IPM Technologies. It began by identifying the key beneficials found in the different Australian vegetable crops and then collating the information already known about the effects of pesticides on these species.

Gaps in information were found and these were filled by the research team conducting their own laboratory testing. A protocol was developed to test acute toxicity. It involved exposing the different species to a product for 24 or 48 hours in treated petri-dishes.

For some products that showed very low acute toxicity, the team carried out sub-lethal testing. Sub-lethal pesticide effects can impact populations of beneficial species by reducing egg production or preventing them from reaching the adult stage. The final stage of the project was producing the guides.

## Acknowledgements

This project was funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.



## Further information

Please contact Jessica Page at [jessica@ipmtechnologies.com.au](mailto:jessica@ipmtechnologies.com.au).

The crop-specific guides are now available to download and print from the AUSVEG website: [ausveg.com.au/biosecurity-agrichemical/crop-protection/#IPM](http://ausveg.com.au/biosecurity-agrichemical/crop-protection/#IPM).

The final report for this project is available on InfoVeg. Readers can search “VG16067” on the InfoVeg database: [ausveg.com.au/infoveg/infoveg-database](http://ausveg.com.au/infoveg/infoveg-database).



A juvenile ladybird.  
Image courtesy of IPM Technologies.

# VG18002: 2019 Vegetable Industry Leadership and Development Missions – the U.S.A.

## Facilitators

Project VG18002 was facilitated by AUSVEG. The tour was led by Elyse Rosewall from AUSVEG.

## Major findings

Project VG18002 funded a two-week study tour for a group of Australian vegetable growers to visit vegetable growing regions and innovative agricultural companies in the U.S.A.

The tour connected established and emerging Australian industry leaders with peers, ag-tech innovators, growing operations and research institutions across the country.

“Everyone took advantage of the opportunity to engage with new and emerging ag-tech, look at new approaches to age-old on-farm issues and hear from research institutions from all over the world to develop a greater understanding of up-and-coming applications of research and technologies outside of Australia,” Tour Leader Elyse Rosewall said.

The tour also included visits to many leading American vegetable producers, including Bolthouse Farms in Bakersfield, Tanimura & Antle and Rio Farms in the Salinas Valley, Vessey and Co and Top Flavor Farms in Yuma and innovators throughout the supply chain across California and Arizona.

“Many participants were able to take advantage of the opportunities to meet with representatives from companies to discuss how they can implement new technologies on-farm back home, particularly innovative technologies like the PlantTape automated planting technology,” Elyse said.

Some key findings included the potential of automated harvesting and planting. The demonstration of the PlantTape technology was a key highlight, as well as using more biological additives at planting and building organic matter within the soil, along with issues with cost and availability of labour in both countries.

“Throughout the tour, it became clear that the scale of vegetable production in Australia was different than in the United States,” Elyse said.

“However, this gave participants a greater appreciation of how their

colleagues in America manage production on a larger scale – the advantages of a steady and relatively cheap source of labour, and the technologies and innovations that have been implemented to achieve this feat.”

Participants were given the opportunity to attend the 2019 PMA Fresh Summit event, which included an expansive trade show. Around 1,200 exhibiting companies showcased a range of innovative products and technologies to help improve the productivity and profitability of growing and supply chain businesses.

“With over 24,000 attendees, Fresh Summit also serves as a reunion of sorts, with industry colleagues reconnecting at various social functions, including the opening reception and an Australasian Reception hosted by PMA A-NZ,” Elyse said.

“This provided a great networking opportunity for the growers to meet with an array of individuals from across the supply chain, retailers and other growers from the region to discuss industry issues of mutual concern and create new relationships within the Australasian region.”

## Outcomes

During the mission, many participants discovered innovative ways to value-add or create an off-farm income and noted the importance of diversifying to remain profitable as a business.

In addition, the Fresh Summit Convention highlighted the creativity that some American growers have used to design packaging that is highly appealing to the consumer and meets a unique consumer need.

“Some of these products were borne purely out of consumer demand, which reinforces that Australian vegetable

growers have an opportunity to look more closely at what the consumer desires, especially when it comes to convenience,” Elyse said.

“The tour allowed everyone to expand their knowledge on the different production practices and the challenges faced by other growers in the global horticulture sector.”

The tour also highlighted the important role that research, ag-tech and automation can play in a vegetable growing operation.

“Australian vegetable growers should look to adopt as much automation into their businesses as possible, as this will not only help to reduce high labour costs but will also ensure their operations remain as efficient as possible and reduce the possibility of human error and contaminants infiltrating crops,” Elyse said.

## Background

The Vegetable Industry Leadership and Development Missions – 2019 were delivered by AUSVEG to provide members of the vegetable industry with the opportunity to expand their industry knowledge and build their local and international networks.

The U.S.A. mission provided an opportunity for a group of emerging leaders in the Australian vegetable industry to visit the world-leading PMA Fresh Summit conference as well as innovative growing operations, research facilities and agribusinesses.

Following their return to Australia, participants shared their new-found knowledge with friends and colleagues to disseminate the key insights discovered from the tour to the wider Australian vegetable growing community.

## Acknowledgements

This project was funded by Hort Innovation using the vegetable research and development levy, contributions from vegetable growing businesses and contributions from the Australian Government.

## Further information

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The final report for this project is available on InfoVeg. Readers can search ‘VG18002’ on the InfoVeg database: [ausveg.com.au/infoveg/infoveg-database](https://ausveg.com.au/infoveg/infoveg-database).