

VG17014: Review of Issues and Options for Preventing and Removing Redback Spiders in Broccoli

Facilitators

Project VG17014 was led by Dr Jenny Ekman from Applied Horticultural Research.

Major findings

Project VG17014 examined factors that may be contributing to redback spiders entering broccoli crops and/or contaminating broccoli after harvest.

Photos by consumers who have found redbacks in their broccoli appear to show newly mature female spiders. Female redback spiders can mature in six to eight weeks at around 25 degrees Celsius (°C). This means spiderlings that enter a broccoli crop at planting can mature by the time it is harvested. Female spiders commonly lay four to seven egg sacs over summer, each of which produces an average of around 110 spiderlings, so a single egg sac can cause a significant infestation.

Since there are no official records of redbacks being found in broccoli crops by growers, it is unclear how or why these spiders get into broccoli but it has been observed that they are occasionally found in broccoli heads after harvest.

The project team's review of overseas research found that long distance dispersal of redbacks can occur through the spiders hitchhiking on equipment and machinery. Social media photos do not show any webbing within the broccoli heads, and this may indicate that the spiders have not been living in the broccoli crops, but actually enter at or soon after harvest. Cross-contamination may be more likely if equipment used for broccoli was previously used for growing and harvesting cucurbits.

The presence of bins and equipment that have been sitting undisturbed for several weeks was identified as

another risk factor for redback breeding and survival.

Alternatively, high populations of potential prey, such as millipedes and ground beetles, may support redback survival and breeding in cropping areas. The research team inferred that the shift to Integrated Pest Management (IPM) using selective insecticides is likely to have increased survival of both spiders and their non-target prey organisms.

"Redbacks like dry, sheltered spots with available prey such as millipedes and beetles – none of which are pests of broccoli so are not otherwise controlled. Therefore, adoption of IPM, minimum tillage, drip irrigation or previous cropping with cucurbits such as pumpkins – which also provide a relatively good environment for spiders – may allow populations to increase," project lead Dr Jenny Ekman said.

Dr Ekman identified hygiene and staff training as the most effective methods of reducing the incidence of spiders being found in broccoli by consumers.

"Field hygiene and cleaning equipment is important, so that you're not providing harbourages close to growing areas or on equipment that is moved from site to site or used during harvest. This will prevent populations increasing in the first place, as well as postharvest contamination," she said.

"Training pickers and packers to look for spiders is another line of defence, just in case the odd spider does manage to enter the crop."

In terms of other control strategies, pesticides may be used if an infestation is found; however, the researchers did not recommend spraying broccoli in the field. There are likely to be few, if any, spiders within the crop and such sprays would strongly disrupt existing IPM programs.

If using a pesticide to clean infested equipment, the team found that a

product formulated in oil is more likely to penetrate egg sacs than a product formulated in water.

"It was also interesting to note that simple detergents appear to be deadly to redbacks," Dr Ekman said.

Background

Since 2016, there have been numerous complaints from consumers in all Australian states who have found redback spiders in their store-bought broccoli. In addition to the obvious safety risks, high profile complaints can be damaging to the reputation and sales of broccoli growers.

"While finding a spider is clearly rare, social media makes it easy for the person to complain to the retailer, as well as to broadcast pictures to everyone they know," Dr Ekman explained.

"The last thing we want is for people to stop eating broccoli, as it is a healthy, nutritious and tasty product. So, this project was all about figuring out why spiders might be in the broccoli in the first place, and what growers could do to stop it happening."

Despite their fearsome reputation, Dr Ekman reminded us of the bigger picture.

"Spiders may not be cute and cuddly, but they have their place in the environment and are important pest controls. We should appreciate them – but not pack them with the broccoli all the same!"



Acknowledgements

This project was funded by Hort Innovation using the vegetable research and development levy 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 'VG17014' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.

VG18002: 2019 Vegetable Industry Leadership and Development Missions – Agritechnica

Facilitators

Project VG18002 was facilitated by AUSVEG. The tour was led by Shakira Johnson from AUSVEG.

Major findings

Project VG18002 funded a two-week study tour for 10 vegetable growers to visit to Germany and the Netherlands. Participants attended Agritechnica – Europe’s largest farm machinery and technology show held at the world’s largest exhibition grounds – and visited some of the world’s most advanced growing operations, research facilities, agribusinesses and world-renowned innovators in the agriculture sector.

“The tour featured a diverse range of growers from across Australia and offered participants the opportunity to build strong networks among the diverse group of growers,” Tour Leader Shakira Johnson said.

“The tour connected Australian established and emerging industry leaders with peers, agritech innovators, growing operations and research institutions across Europe, with delegates expanding their leadership capacities while developing a greater understanding of horticulture outside of Australia.”

The Agritechnica exhibition was the highlight of the tour. From massive tractors fitted out with the latest high-tech gadgets to low-cost IoT (Internet of things) sensors to support on-farm data collection, Agritechnica is considered one of the most important agricultural technology exhibitions in the world.

“Tour participants spent an entire week learning all about cutting edge technologies and innovations for agricultural systems at Agritechnica – even that long was barely enough to get through all of the exhibitors,” Shakira said.

“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.”

The time spent in the Netherlands in the second half of the tour provided a

valuable opportunity for the tour group to learn more about the latest innovations in European agriculture that offer a glimpse into the future of agriculture.

“Tour participants were able to learn from leading businesses and institutions in the Netherlands, including Amsterdam’s first vertical farm, leading greenhouse orange capsicum producer Barendse-DC, vegetable breeder Rijk Zwaan and world-renowned researchers and software developers,” Shakira said.

“The tour itinerary was designed with a strong focus on exposing participants to the latest innovations taking place in the global horticulture industry and extending their networks with some of the region’s leading vegetable producers, particularly in protected cropping.”

During the tour, many growers came across innovative ways to value-add or create an off-farm income and noted the importance of diversifying to remain profitable as a business.

“The participants relished the opportunity to discuss common issues with international growers and find out the strategies they have implemented to overcome these challenges, and how they could improve areas of their own farms,” Shakira said.

Recommendations

It became clear that there was a strong focus on maximising productivity with limited space using protected cropping methods and greenhouses, as well as utilising automation and technology to produce a superior product for the consumer.

“Most of the businesses the tour visited placed a strong importance on the consumer, whether it was producing a particular variety of capsicum, or creating a local supply chain that allowed for consumers to eat locally-sourced

product,” Shakira said.

“The group also recognised that 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,” Shakira said.

Importantly, the tour also allowed participants to expand their local and international business networks and discuss mutual areas of interest.

“As emerging leaders in their own businesses and the wider industry, the tour gave participants the opportunity to learn skills and knowledge to broaden their networks and leadership capabilities. This will boost their confidence to take up leadership positions in the future and play a direct role in advancing the future of the Australian vegetable industry.”

Background

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.

Vegetable Industry Leadership and Development Mission – Agritechnica allowed participants to visit the world-leading Agritechnica exhibition, as well as innovative growing operations, research facilities and agribusinesses in the Netherlands.

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

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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.