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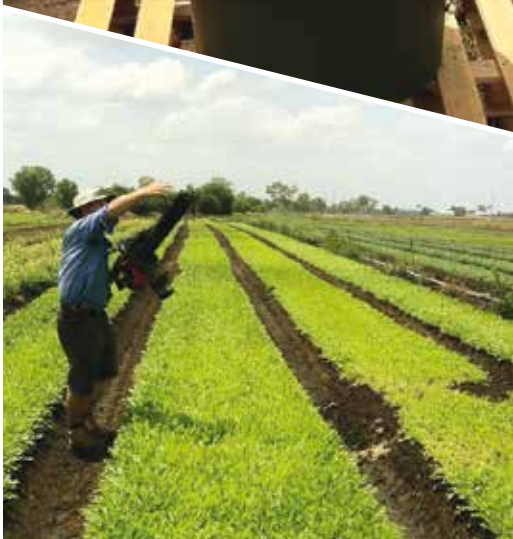
HAL R&D project number: VG12108

Project VG12108 is investigating a proposed solution for improvements to the supply chain to reduce the potential for insect contamination in processed leafy vegetables.

- **National Bee Pest Surveillance Program**

HAL R&D project number: MT12011

Project MT12011 is providing an early warning system to detect new incursions of exotic pests and pest bees, and trade support in order to facilitate their exportation to countries sensitive to a range of such pests.



Improving the management of insect contaminants in processed leafy vegetables.

Facilitators:

Milestone 102 of Project VG12108 has recently been completed by Project Leader Dr Gordon Rogers from Applied Horticultural Research NSW and team.

Introduction

A significant and recurring problem for leafy vegetable growers and processors is insect contamination in fresh produce and the processed product. Insect contamination causes rejections and lost sales for growers, added costs for processors and negative publicity for retailers.

Rejections are expensive for growers, lead to lost sales for processors due to unfulfilled orders, and reduce income throughout the supply chain. Consumers are also affected as product supply is reduced and retail prices can rise as a result.

Leafy vegetable processors have experienced increases in contaminant levels of processed products in recent years with the summer of 2012/13 being particularly bad. Victoria has been the most severely affected with one processor reporting that 70% of the insect complaints originated in the state. However, seasonal spikes are seen throughout Australia's supply regions.

About the project

Project VG12108 aims to find ways to reduce insect contaminants in processed leafy vegetables through a coordinated approach at the processor and grower levels. New methods to control and remove insects will be assessed, along with the development of a standard set of sampling guidelines for use in the field and factory. A best-practice guide will also be developed and made available to the wider industry.

Project leader Dr Gordon Rogers said trials were well underway and numerous activities had been completed since the project's implementation in mid-2013.

"The project team first looked at the US experience," Dr Rogers said.

"In California, similar insects to those in Australia find their way into harvested baby leaf crops. The main focus on US farms has been to clean up border areas such as weedy fence lines, which can harbour the moths and beetles."

"In Europe, good results have been achieved using Neem extracts for deterring beetles, but in Australia these extracts are not registered for use on food crops. Synthetic pyrethroids are widely used, as well as spinosad, which we will trial in Australia."

"There has also been success in Europe using pheromone traps to disrupt mating of cluster caterpillar in spinach, and to monitor moth activity. This approach could potentially be used in Australia for beet webworm."

Field trials

In the field, the project team has looked at harvester modifications designed to remove insects, and assessed the effectiveness of low-toxicity insect deterrents applied close to harvest time.

Dr Rogers said trials conducted in Gatton, Queensland and East Gippsland, Victoria would help determine whether current field practices could be improved to reduce insects in the crop near to harvest time, or if further modifications to baby leaf harvesting equipment were required.

"The most encouraging results so far have been on modifications to baby leaf harvesters," he said.

"In East Gippsland trials this summer, the combined use of fans at the front of the tractor, chains dragged through the crop and a perforated conveyer belt was highly effective at removing Rutherglen Bugs and flies from spinach."

Brad Giggins, who has conducted the trials, said: "We need to test these harvester modifications again when there is a high pressure from soldier beetle and moths to see if they are still effective under those conditions."

Trials in Gatton and East Gippsland have also been used to evaluate the effectiveness at controlling insects of chilli sprays and natural pyrethrum applied to baby leaf spinach crops close to harvest time.

"In the Queensland trials, the conventional controls (Dominex™ and Movento™) were effective at controlling insects, and there was no added benefit from applying insect deterrents two days before harvest. The East Gippsland trials showed a similar result with no added benefit from using deterrents,

especially against Rutherglen bug," Dr Rogers said.
A third set of trials evaluated light traps, which were set up in duplicate at Gatton to test their effectiveness at reducing pressure of moths on the crop.

While the traps proved effective at catching moths, there was no difference observed in the number of moths in spinach crops nearby.

Factory assessments

A preliminary investigation of the OneHarvest factory at Wacol, Brisbane was carried out to determine areas where improvements would be likely to provide the greatest benefits.

Dr Rogers said initial findings highlighted that the best opportunity for insect removal was to focus on optimising the optical sorter.

Further trials are planned for the Wacol factory and OneHarvest's processing facility at Bairnsdale, Victoria.

THE BOTTOM LINE: VG12108

- Using all harvester modifications at the same time, keeping insects well under control and cleaning up areas that potentially could harbour insects near leafy vegetable crops have the greatest potential to reduce insect contamination.

Acknowledgements

The project is funded by HAL with voluntary contributions from OneHarvest. For further information contact Gordon Rogers (AHR) 02 9527 0826 or Brad Giggins 0427 014 990.

National Bee Pest Surveillance Program

Facilitators:

Project MT12011 is being conducted by Project Leader Rod Turner, of Plant Health Australia.

Introduction

Australia's freedom from many of the exotic pests that affect honey bees overseas provides the Australian honey bee industry advantages in terms of honey production and its ability to deliver paid pollination services.

This freedom also provides plant industries that are reliant on, or responsive to, pollination by honey bees, yield advantages through access to managed pollination services, as well as through the presence of wild honey bee populations that contribute a significant amount of incidental "free" pollination.

A system of national surveillance for early detection of a key pest threat of honey bees, such as the varroa mite, is an important tool in preventing its establishment. The earlier a new pest can be detected the greater the chance it will be restricted to a limited area and that eradication will be technically feasible.

About the project

The National Bee Pest Surveillance Program (NBPSP) is an early warning system to detect new incursions of exotic bee pests and pest bees. The program follows on from the National Sentinel Hive Program established in 2000 to improve post-border monitoring around Australia for exotic pests of honey bees.

Project Leader Rod Turner, of Plant Health Australia, said the NBPSP involved a range of surveillance methods conducted at sentinel hives, i.e. the most likely entry point for bee pests and pest bees throughout Australia.

"The purpose of this project is to provide information on Australia's honey bee industry health status to support the beekeeping and horticultural industries, facilitate trade in honey bee industry commodities and meet Australia's international reporting obligations," he said.

"Early detection of these pests is critical to providing the best possible opportunity to eradicate an incursion, and to limit the size and cost of an eradication program."

"The program also contributes to competitive market access for Australia's queen bees and packaged bees, and provides information on Australia's capabilities and activities regarding surveillance and control of honey bee pests and pest bees."

Surveillance of honey bee health will be undertaken through support for a national program of sentinel hives, remote surveillance hives, sweep netting, and hobby beekeeper involvement at high-risk ports of entry throughout Australia.

"Hives are tested every two months using an acaricide (miticide) for the early detection of varroa mites and tropilaelaps mites, which could possibly enter via exotic bees on a vessel or other transport," Mr Turner said.

"Samples of bees are also taken from these sentinel hives every two months and submitted for dissection and examination for tracheal mite, which could also enter via exotic bees."

Major findings

In 2013, 128 sentinel hives for bee parasites were maintained

at sea ports and airports across Australia that receive significant volumes of imported cargo or regular berthing of vessels from international locations where exotic pests of honey bees are known to occur.

"This is an increase from the 26 sentinel hives which were managed throughout Australia in 2011," Mr Turner said.

During the same period, 54 empty hives were deployed at a number of southern ports as an additional measure for detecting swarms of exotic bees. Trials of remote surveillance hives continued to be conducted in 2013, with deployment in Cairns and Brisbane, Queensland. These will continue to be trialled in 2014 at additional locations for inclusion in the NBPSP.

Mr Turner said formalised surveillance for small hive beetle (SHB) across Australia also began in 2013.

"Surveillance consisting of hive inspection and oil traps began in the Northern Territory and Tasmania where SHB is currently not present, as well as southern Western Australia, where SHB is confined to northern Western Australia (Karratha)," he said.

The Australian-wide registration of Apithor was released in December 2013 and will be incorporated into the NBSP as the formal method of surveillance for SHB from 2014 onwards.

Conclusion

The NBPSP is an ongoing program and a component of a larger program being developed by the Australian Honey Bee Industry. Surveillance will be a key component of this program, combined with advice to beekeepers on how best to manage their hives and how to prevent endemic and exotic pests affecting their livelihoods. Beekeepers with improved biosecurity skills will benefit pollination-reliant industries by ensuring a greater reliability of pollination services. It is envisaged the new program will commence early next financial year.

THE BOTTOM LINE: MT12011

- The premise of this project is to try and protect the honey bee industry from exotic bee pests and the varroa mite.
- If varroa establishes in Australia, feral bee numbers will dramatically decline, the cost of managing hives will increase and pollination-reliant industries will be more dependent of pollination providers. The cost of these services will also increase significantly.

Acknowledgements

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Photo credits:
VG12108 photos credit: Dr Gordon Rodgers, Applied Horticultural Research NSW.
MT12011 photos credit: Plant Health Australia.

Please contact Jamie Racicos at AUSVEG on 03 9882 0277 or email jamie.racicos@ausveg.com.auto submit topics for potential inclusion in future editions of **vege**notes.

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