

SUSTAINABLE SUCCESS STORIES



Young Grower of the Year uses local resources and research to develop a highly-successful low-input IPM system

Sustainable Success Stories showcase how the Adelaide and Mount Lofty Ranges NRM is working with industry to improve production outcomes in the South Australian vegetable industry.

IPM trial work and development

Penfield based greenhouse grower and AUSVEG national Young Grower of the Year has transitioned his growing practices to a low-input IPM growing system over a number of years.

Background on the trial work

Daniel Hoffman has been engaged for a number of years in regional AMLR NRM funded trial work led by respected local advisors such as Dr Steve Coventry. In addition, he has engaged with AUSVEG SA reseller training initiatives and remained engaged with a number of national researchers such as Angelica Cameron of IPM Technologies who have conducted significant trial work on the Northern Adelaide Plains.

As a result of his ongoing engagement, Daniel has continued to develop his production system over a number of years using Integrated Pest Management principles.



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Background on Daniel Hoffman

Daniel Hoffman is a recent winner of the AUSVEG national Young Grower of the Year award, in recognition of his significant innovation on-farm and his work in sharing his production knowledge with other growers. He has a farm that totals 11 acres with polytunnels covering 14,400 square metres. In the past the crops he has grown include tomatoes, capsicum, eggplant, zucchini and cucumber, but in recent times he concentrates mostly on Roma tomato production which he sells to supermarkets via intermediate suppliers. He is a leading grower within regional young grower groups and regularly makes his farm available for field days and commercial and government trial work. A constant innovator, Daniel always strives to get the best out of his production system.

“I am always looking for new ways to grow a more efficient crop, so I regularly talk to researchers and other growers about the opportunities out there to do trial work”.



Integrated Pest Management work

Daniel controls insect, mite and nematode pests using an Integrated Pest Management (IPM) approach which replaced his old chemical-based approach. This was standard for his district at the time and involved fumigating the soil with products such as metham-sodium and then spraying an insecticide or miticide weekly for each pest as required.

This was the standard conventional approach for growers in the district and still remains so for many, but Daniel observed progressively poorer results from sprays and fumigation and also that the plants seemed to be weakened by the multiple pesticide applications. This led him to look at other options and so explore the use of IPM.

The change was fairly quick and after three years 90% of the farm was shifted to IPM. The exception was the small section that was still run by his parents, who continued to use the familiar chemical-based strategy.

The first step was to stop using broad-spectrum products that were designed to kill a wide range of invertebrates. Instead of fumigating the soil Daniel used break crops such as sorghum and mustard or radish crops in rotation with his fruit and vegetable crops. Instead of spraying products that killed beneficial insects and mites he used more selective products and began buying and releasing commercially produced beneficial insects and mites. These were predators or parasites of the key pests in his crops. In addition, he began brewing up his own microbe mixes and using natural fish fertilisers, worm fertilisers and soil conditioners.

“I had to learn a lot before and during the change; how to bring my soil back to life and how to control soil pathogens without chemicals. I had to learn what insects did, what they looked like, what new softer chemistry to use to target pests while not killing off the good guys, and also what were acceptable levels of pests.”

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To achieve this Daniel got advice from biological experts, bug experts and agronomists. However, it was not an easy transition. Thirty years of farming a certain way does not change overnight and in the beginning, there were problems. There were soil disease problems and beneficial species could not get established because of chemical residues. Daniel had to be patient and keep working on improving the soil health and biology and using different insecticides to keep pest numbers down until the predators and parasites could get established.

Daniel emphasises the need to look after soil health as the starting point for the whole process. “The benefits to a commercial crop following a well grown cover crop are amazing! This includes incredible increases in production for crops such as capsicum, cucumber and tomato.” Doing this has shown good soil pathogen and nematode control and also a benefit in putting organic matter back when the cover crop is mulched in. Doing things this way also ensures a carry-over of beneficial soil-dwelling insects and mites instead of killing them with metham-sodium.

Learning how to use specific microbes and fungi in the brews that Daniel made was important and allowed him to control diseases such as Pythium. That meant learning how to use *Bacillus subtilis* and *Trichoderma* combined with using natural fish, Seasol and worm fertilizers to get rid of chemical residues and put life back into the soil.

Now his patience has been rewarded. “It has all paid off now. I rarely spray at all apart from the odd fungicide when it’s needed. I have grown entire crops of tomatoes over five months and have only needed to spray once or twice the whole time and that’s mostly for powdery mildew or to bring down whitefly numbers slightly until *Nesidiocorus* (a whitefly predator) can get back in control.”

“Now I spray so rarely that I haven’t even bought chemicals for over a year, the plants’ roots are far stronger than ever creating super strong crops, fruit set is fantastic and any old problems like botrytis are basically gone. I’ve found that when you don’t spray at all then your plants are super strong and happy all the time, nature has taken over.”



In the last three years Daniel has developed his IPM strategy even further, utilising some very effective management (cultural) control measures.

“About three years ago I basically stopped doing any contracted releases of commercially produced insects and mites and only used small top ups with capsicums and tomatoes, to the point where I haven’t done a release in over a year in tomatoes. I’ve managed to keep a healthy supply of beneficial insects maintained at my farm using host plants throughout my property and almost cutting back on chemical use entirely. Every time I plant a new crop the good guys just move in naturally and begin protecting my crops from the get go.”

The plants Daniel uses to provide flowers to feed beneficial insects include basil, zucchini, pumpkin and melons. These and some native plant species act as host plants as well as providing pollen and nectar. He opens the sides of the structures at key times to allow the movement of beneficial insects between crops.

One other important factor that allows Daniel to keep on top of the pest issues is that he plants around 6,000 plants per planting about 6 times per year instead of one or two larger plantings per year. “This allows me to manage the crops with minimal labour requirements and a steady amount of production and income”.

“Pest management decisions these days are pretty easy. I just keep an eye out and if a pest like whitefly or mites get beyond my comfort levels (around 20-30% infestation) then I might do a light spray to bring them back in control or just monitor to see if the good guys get back on top.”

“It is important to note that once growers start down this path then they need to continue. All the good work can be undone if hard sprays are used again.”

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Key practice change results

The new practices introduced resulted in a number of benefits for Daniel, including:

- Implementation of a low input growing system saving time for pesticide applications and money on farm inputs
- Improved pest management control and a better rotation of chemistry preventing resistance management issues
- A strong ongoing engagement with researchers and local resources such as AUSVEG SA and AMLR NRM to access new research and access assistance to apply results on-farm.

Background on Sustainable Success Stories

AUSVEG SA and the AMLR NRM board wanted to highlight the significant trial work and innovation which has occurred in the Northern Adelaide Plains over the past few years as a means of highlighting the growers who have made significant advances in improving the sustainability and efficiency of their practices.



Background on our partnership

AUSVEG SA and the Adelaide and Mount Lofty NRM Board have partnered for a number of years to deliver extension activities and activities which highlight and support the adoption and promotion of sustainable practices in the intensive horticulture industry throughout the Northern Adelaide Plains region. The Northern Adelaide Plains is one of the most prominent horticulture regions in Australia and produces over \$500 million in horticulture per annum at the farm gate with key crops including greenhouse produce, potatoes, onions and other vegetable crops.

AUSVEG SA and AMLR NRM have had a strong working relationship in a number of areas and have conducted significant work together in areas such as Integrated Pest Management extension and trials, advanced compost use, biosecurity practice change and weed management over the past years.

Further information

This projects outlined in this case study were delivered by AUSVEG SA in partnership with the Adelaide and Mount Lofty NRM Board and Hort Innovation IPM reseller training project.

AUSVEG SA and the AMLR NRM have a number of resources and programs designed to assist South Australian horticulture producers to improve their practices and any interested growers can contact Jordan Brooke-Barnett, AUSVEG SA CEO on 0404 772 308 or Jordan.brooke-barnett@ausveg.com.au to discuss programs and opportunities.

Images have been provided by AUSVEG