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| Spring - 2020

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Editorial

It is well-known that Australians are not eating enough vegetables. But when you read the statistics released from time to time, it hits home as to how low those consumption figures are.

A recent report from the Australian Bureau of Statistics (ABS) indicated Australians are only buying enough vegetables for 2.3 daily serves. This is well short of the recommended five or more daily serves.

So, what is industry doing to combat this veg consumption challenge?

For starters, there is the Good Mood Food initiative that you might have seen on television while watching shows such as *MasterChef Australia* and *The Project*.

Developed by Hort Innovation, this marketing campaign is supporting the horticulture sector, particularly through tough times experienced in 2020. It is aimed at motivating more people to consume more Australian fruit, vegetables and nuts, more often – with the messaging 'the more Aussie fruits, veg and nuts you eat, the better you will feel'.

AUSVEG is fully supportive of The Good Mood Food initiative, and we are taking the lead in the vegetable sector with the launch of eat more AUSVEG.

The eat more AUSVEG initiative has been established to provide consumers with practical information about how they can make tasty and healthy meals with a variety of vegetables, as well as introducing them to the growers behind their fresh produce. This information can be found on the @eatmoreausveg Instagram page, and keep an eye on this channel as we continue to tell our growers' stories – or you may want to share your own.

Meanwhile, the vegetable industry is setting its sight on its youngest consumer base through the Taste & Learn Program.

The Taste & Learn Program has been developed by CSIRO, and it uses activities shown to improve kids' willingness to eat vegetables and provides primary school teachers with simple, hands-on lesson plans aligned with the Australian curriculum.

Taste & Learn is available to all Australian primary schools. Growers are encouraged to contact their local schools to get them involved in the program and increase local kids' awareness around increased veg consumption. To find out more about the program, please visit research.csiro.au/taste-and-learn.

It is pertinent that the industry continues to educate our students, children, and even older consumers, about the benefits of vegetables and how they can learn to enjoy eating them. This will ultimately ease the pressures on the health system with fewer diet-related illnesses and lead to improved health outcomes, along with increased vegetable sales that will benefit the entire Australian vegetable industry into the future.

Message from the Chair

AUSVEG welcomed the announcements from the Federal Government to establish an agricultural workers' code, however is urging the states and territories to work together to agree on conditions that will allow farmers and essential agriculture workers to more easily cross state borders as quickly as possible.

Our greatest concern is that some state governments will not recognise just how critical a labour supply is. Those states that don't take the labour shortage crisis seriously are going to dramatically compromise the community's ability to buy safe and healthy food, as well as risk the economic viability of those growers that provide it. State and federal governments must agree on an agriculture workers movement code to ensure the interstate movement of farmers and farm workers.

There have been ongoing concerns in the industry that there will be a shortage of workers on fruit and vegetable farms, particularly given the decline in Working Holiday Makers in Australia. Solutions to this issue will need a multi-pronged approach – access to an efficient and reliable workforce has been a long-term issue for vegetable growers that has been exacerbated by the COVID-19 pandemic.

It was also recently announced that state governments, with the endorsements of their respective Chief Medical Health Officers, will be able to restart the Seasonal Worker Programme and Pacific Labour Scheme to allow eligible workers to come to Australia. This follows a pilot program agreed to by the Federal and Northern Territory Governments that will allow workers under the Seasonal Worker Programme to travel to Top End farms and undertake vital farm work. The state governments must now agree to allow for the staged resumption of the Seasonal Worker Programme, to allow international workers back into the country to work on farms.

AUSVEG will continue to work with the state and federal governments to develop solutions to ensure the interstate movement of agricultural workers and essential workers during the COVID-19 pandemic. This will give vegetable growers and their farming counterparts confidence knowing that they will have the workers they need to get their food and fibre products to consumers during this time.

I encourage vegetable growers who are looking for willing workers to use the National Harvest Labour Information Service (NHLIS). Further details can be found at employment.gov.au/harvest-trail-services.

Meanwhile, AUSVEG has welcomed the appointment of Mitchael Curtis – a mango, melon, and vegetable grower from the Northern Territory – as a Grower Director on its Board.

Mitchael will replace fellow Top End vegetable grower Michael Quach, who is stepping down after a three-year tenure. I would like to thank Michael for his contribution to the industry during his time on the AUSVEG Board and congratulate Mitchael on his appointment.

I look forward to working closely with Mitchael to advocate for the Northern Territory vegetable and horticulture sector, which is becoming increasingly important in the wider national agriculture industry.

Bill Bulmer
Chair
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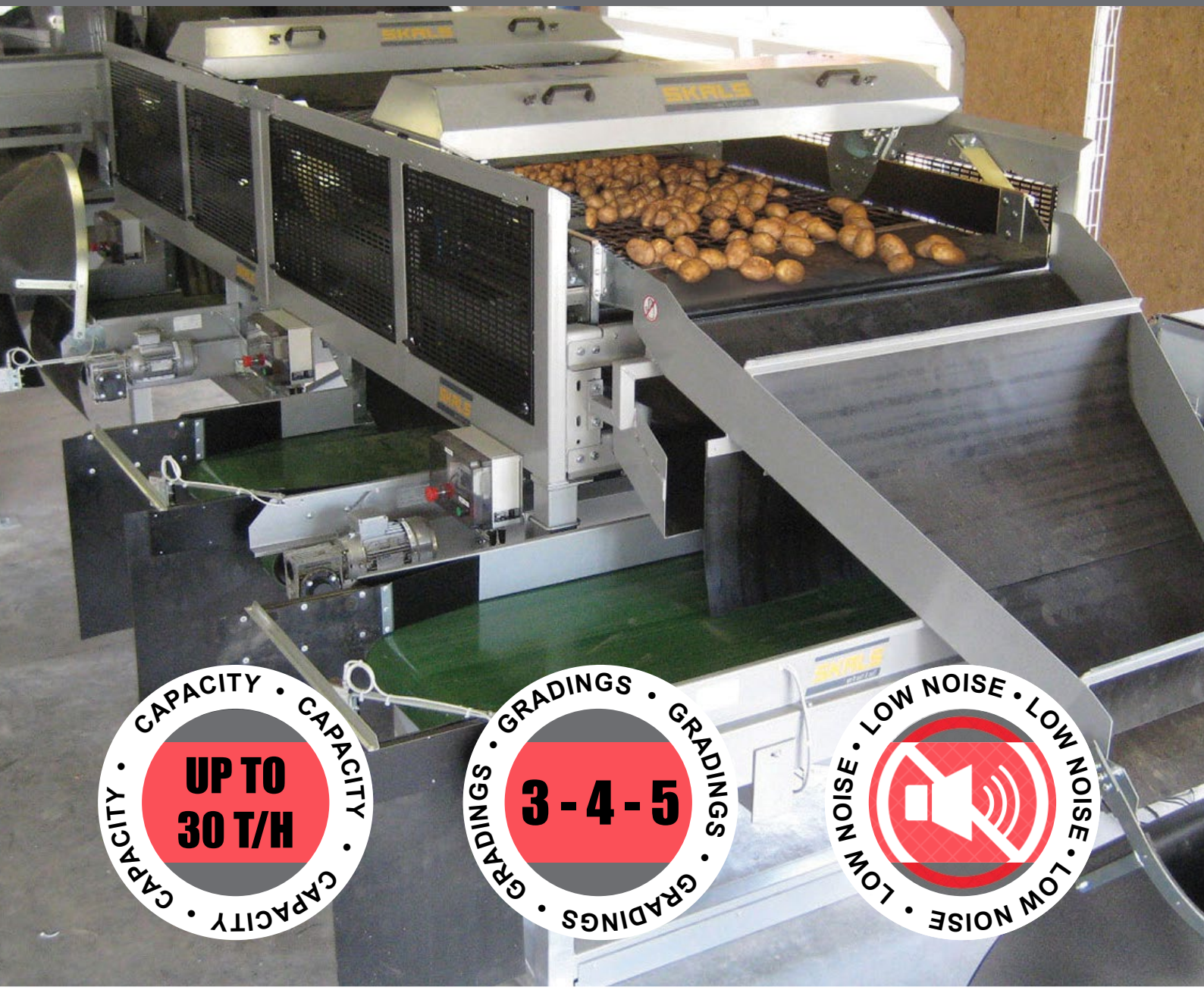

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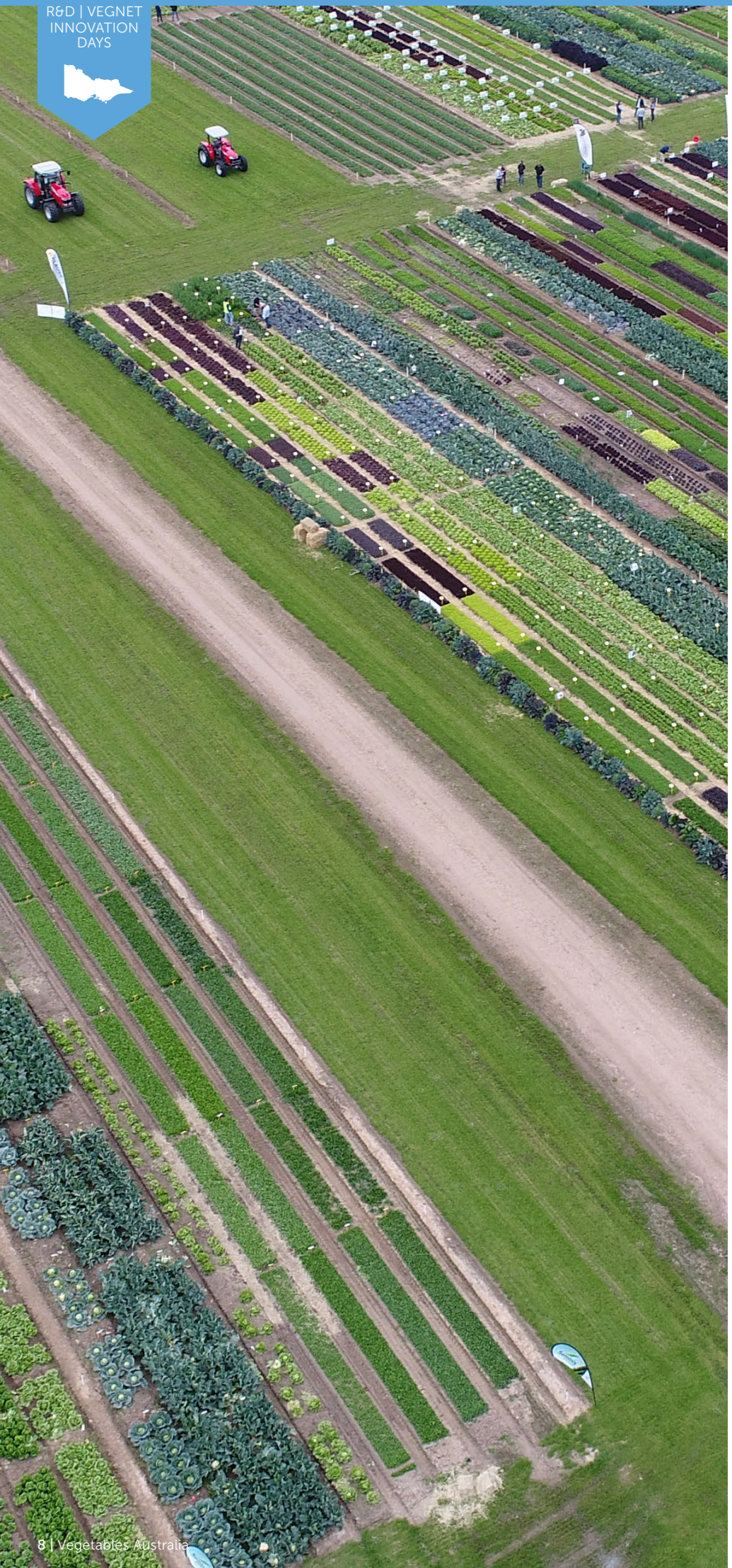

The show goes on: Innovation Days given green light

After three years of meticulous planning and a pandemic that threatened to derail organisers' hard work, the 2020 East Gippsland Vegetable Innovation Days were staged in-person and virtually from 5-7 May in Lindenow. *Vegetables Australia* spoke to EGVID Event Coordinator and Food & Fibre Gippsland Regional Development Officer, Bonnie Dawson, about the event and how it unfolded across the three days.

One of Australia's most productive vegetable growing areas, Lindenow was gearing up to stage the country's biggest field day event in 2020. It was going to be extra special this year, with the East Gippsland Vegetable Innovation Days (EGVID) set to incorporate the Tenth International Spinach Conference.

Unfortunately, the two events – like many around Australia and the world – were severely impacted by the COVID-19 pandemic. The Spinach Conference was postponed, while the decision was made to stage EGVID predominantly online, with just a small number of industry members allowed to attend the site in-person in accordance with strict social distancing rules.

Originally the event set out to enable Australia's top 11 seed companies to showcase their new, favourite and innovative varieties for growers and the industry at large. It aimed to provide a learning opportunity for growers and industry representatives to view exhibits from a broad range of industry service providers and research initiatives. Another major component was networking and doing business, while celebrating being a vital part of the food chain in Australia and abroad.

However, considering the pandemic, the event's focus became solely on providing growers with access (in-person and virtually) to seed trials and agricultural chemical demonstrations.

Adapting to change

EGVID organisers responded to the pandemic rapidly and with great success.

"When we realised that the COVID-19 pandemic would prevent us from hosting the field days as originally planned – with an expected turnout of approximately 1,000 industry members – we turned our focus to ensuring that the effort that had already been invested into growing seed trials and demonstration sites wouldn't be wasted," EGVID Event Coordinator and Food & Fibre Gippsland Regional Development Officer, Bonnie Dawson, said.

"We offered to capture this content and results for the seed and crop improvement companies in a series of videos, which all but one of the companies accepted."

To give growers instant access to the site, the event team scheduled and streamed live crosses from each site over Facebook throughout the three days.

"These were popular among our followers and companies have been able to share these interviews and site walkthroughs further with their own followers since," Ms Dawson said.

The event also had the support of the Soil Wealth and Integrated Crop Protection (ICP) project. Its team live-streamed similar walkthroughs of the entire site, involving Organising Committee members and agronomists Stuart Grigg and Noel Jansz. A strategic levy investment under the Hort Innovation Vegetable Fund, the Soil Wealth and ICP project also delivered a webinar on cover cropping in conjunction with the event that involved growers from across the country.

"In the end, we were able to invite some growers to come and view the seed trials and demonstration sites in person in limited numbers across the three days. Each of these attendees was required to register in advance and in doing so, agree to abide by our COVID-19 Policy," Ms Dawson explained.

With Victoria Police and local authorities' permission, EGVID could have up to 50 people on-site at any one time, which presented organisers with the opportunity to invite approximately 60 growers and industry members to attend for half a day each. Most growers were from the local area, however a small number travelled from other parts of Melbourne including Clyde and Werribee.

Switching online

Ms Dawson said that through adversity, EGVID developed into a new format that will be integrated into events in the future and set a new benchmark for these type of industry events.

"Although nothing fully replaces face-to-face interactions, being forced to take content online has given a wider

Social distancing measures were adhered to at EGVID 2020.

→

Food & Fibre Gippsland Chief Executive Officer Nicola Pero and VegNET Regional Development Officer Bonnie Dawson.

audience access to the innovations that were on display at the site," she said.

"All of those who have been asked believe that we should include live streaming, the use of social media and video production in future events. Social media provided the opportunity for industry members 'playing along at home' to get in touch and encourage their industry colleagues from afar."

Each video was viewed by up to 1,500 individuals from around the world on Facebook.

"A lot of the people who physically attended EGVID also viewed some of the videos that were streamed to get a recap of the site or to gain a different perspective," Ms Dawson added.

There has also been an overwhelming response to what growers saw in the field, particularly new varieties. Those who attended the Innovation Days in-person benefited from having time and space for discussions with seed company representatives.

"Ninety per cent of growers who responded to the event survey have planned, or are planning, to order new varieties of seed that they saw at the demonstration site. While most were planning to order agricultural chemical, fertiliser or stimulant products that they saw," Ms Dawson said.

"Many of the growers who were present and company representatives also commented that they valued having more time for key customers without many others around competing for their attention. Therefore, it's likely that part of any future EGVID would also follow this structure."

Finally, Ms Dawson would like to thank the major sponsors of the event including Zorvec™ active by Corteva Agriscience, Agriculture Victoria and East Gippsland Shire Council.

"It was a huge collaborative effort headed up by Directors Andrew Bulmer and Stuart Grigg. Thank you to all involved in making this event happen," Ms Dawson said.

VegNET update

In others news, Ms Dawson is currently planning the next phase of VegNET Gippsland by developing a longer-term strategy with the newly-formed Regional Extension Advisory Group.

"The focus areas are likely to be environmental management, precision agriculture, improved workforce capability and biosecurity," Ms Dawson said.

"I hope to continue on the same trajectory that Shayne Hyman established; that is, developing and maintaining strong relationships with the diverse bunch of growers from across the region so that I can respond to their individual needs appropriately. This will include connecting growers to other relevant opportunities that are offered by Food & Fibre Gippsland and others in the space."

Find out more R&D

Please contact VegNET Regional Development Officer Bonnie Dawson from Food & Fibre Gippsland on 0407 683 938 or email bonnie.dawson@foodandfibregippsland.com.au.

East Gippsland Vegetable Innovation Days and Tenth International Spinach Conference is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

Project Number: VG19001

Hort Innovation Strategic levy investment | VEGETABLE FUND

Field videos released on AUSVEG website

AUSVEG is now hosting seed trial and demonstration site videos from the East Gippsland Vegetable Innovation Days. Ms Dawson said the filming of these videos took place when the site was in its prime, which was the week of EGVID.

Each seed company has had 5-7 videos produced, and each crop improvement company has had one video of their product trial recorded.

The videos are available in an online catalogue format, so that different seed products can be searched and compared between different companies.

"We believe that this is a unique way to be able to research these products," Ms Dawson said.

"The EGVID videos are also a valuable resource for growers – both those who attended the event in-person and online, and will be available for years to come."

The videos can be found on the AUSVEG website at ausveg.com.au/innovation-days-search.

Digitisation of East Gippsland Vegetable Innovation Days (VG19001) is a strategic levy investment under the Hort Innovation Vegetable Fund.

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DTN's Smart Trap identifying fall armyworm in-field. The green markers indicate positive identification of the pest with the red markers being off target species.

Smart Trap deployed in-field.

Introducing a new in-field trapping tool for veg growers

The Bowen Gumlu region in far-north Queensland is on high alert following the detection of fall armyworm in March this year. Assisting growers in the battle against this exotic pest – as well as a range of other target species – is a new 'smart trap'. VegNET Regional Development Officer Eilis Walker reports on this latest technology and how it will benefit vegetable growers.

Fall armyworm (*Spodoptera frugiperda*) is an exotic pest that was first detected on two islands in the Torres Strait in January this year. It reached the mainland after being detected in the far-north Queensland town of Bamaga in February and was first detected in Bowen on 17 March.

The pest has the potential to significantly damage over 350 different commodities and can devastate high value crops that are grown in the Bowen Gumlu region, including sweet corn, sorghum, maize, capsicums and other palatable fruits and vegetables.

Bowen Gumlu Growers Association President Carl Walker said the greatest concern with fall armyworm is resistance.

"We are concerned that pests or diseases from overseas – such as fall armyworm – may already have resistance to the chemicals we rely on," Carl said.

The Consultative Committee on Emergency Plant Pests has determined that it is not technically feasible to eradicate fall armyworm from Australia, as it has never been eradicated anywhere else in the world.

Finding pest solutions

To address this significant issue, a global provider of actionable data insights is changing the way farmers detect and count invasive, damaging pests in the field. DTN has developed Smart Trap technology, which utilises sticky cards and pheromone lures in the base of the trap to attract the target pest species.

A high-resolution camera then captures images of pests caught in the trap and transmits these to a cloud server. These are then analysed and counted by DTN's computer software. Daily trap images and target pest counts are sent to the growers' Agronomic Platform account, which is easily accessible via mobile or computer to enable them to have a better understanding of the pest burden within their crops.

This Smart Trap technology has taken the guesswork out of insect identification and pest burdens. For growers, this means that they have 24/7 access to the data collected in the trap to make informed decisions about pest management and spraying. They can monitor what is happening in-field remotely without the need to manually enter fields and increase the early detection of pest species. It is easy to install and supports a wide range of both broadacre and horticulture pests, including fall armyworm. The software also can learn new pest species for automatic identification within a single growing season.

DTN Senior Meteorologist Krystelle Venn has been heavily involved in training growers in the use of the Smart Trap technology.

"The Smart Trap can easily distinguish between target and non-target species, with proven results in the detection of fall armyworm," Krystelle said.

"This technology can assist growers to maximise productivity by reducing the time and costs involved with travelling to distant fields to check manual traps. It also enables them to apply pesticides at the optimal time and avoid unnecessary spraying."

This targeted application of pesticide will go a long way in ensuring that the vegetable industry uses chemistry effectively.

"Growers need to remember not to overuse their chemicals, as the misuse of chemicals can cause resistance," Carl Walker said.

It is anticipated that the fall armyworm population will increase as the weather warms up. For growers, being able to remotely monitor pests without the need to travel into the field presents a significant gain in pest management.

Find out more R&D

Please email idm@bowengumlugrowers.com.au.

VegNET – North Queensland is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

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Hort Innovation Strategic levy investment | VEGETABLE FUND

VegNET Lockyer Valley RDO Zara Hall.

Creekside Fresh hosted a dye demonstration night, which focused on the impact of various water volumes, use of adjuvants and nozzle selection on spray performance.

Diamondback moth management in the Lockyer Valley

In this article, VegNET Regional Development Officer Zara Hall investigates how the vegetable industry in south-east Queensland responded to a major production challenge posed by diamondback moth. Diamondback moth is a highly destructive pest that affects vegetable and canola crops across the country.

Resources and further information

Below is a list of online resources about diamondback moth and its management:

- Lockyer Valley Growers newsletter: lockyervalleygrowers.com.au/resources/newsletters.
- Pesticide impact table for brassicas: ausveg.com.au/app/uploads/2020/07/Brassica-guide-docx.pdf.
- Getting the most out of Bt sprays: ipmtechnologies.com.au/2020/01/29/how-to-get-the-most-from-bt-sprays.
- Video: Gatton Research Station Diamondback Moth Management – Demonstration Trial: youtu.be/cHbtIzDO8kY.
- Video: Paul Windolf – Diadegma and Movento® for Integrated Diamondback Moth Management in Broccoli: youtu.be/SQwoat3GCv4.

Diamondback moth represents a major production challenge for all brassica vegetable and canola growers across Australia. In the Lockyer Valley, diamondback moth management has proven increasingly challenging in recent years with growers reporting poor performance for several key Integrated Pest Management (IPM)-compatible insecticides registered in brassicas.

Testing by Greg Baker's team at the South Australian Research and Development Institute – funded through CropLife Australia – has validated growers' concerns, with results showing elevated resistance in diamondback moth to almost all pesticides registered in brassicas at levels that could affect field performance.

In response to a major production challenge, growers and industry led a number of complementary initiatives to manage diamondback moth, including development of an insecticide resistance management strategy and training sessions focused on utilising beneficial insects in cropping systems and latest spray technology.

Taking action

A pivotal step in implementing new practices for diamondback moth management was the formation of a Diamondback Moth Management Committee, facilitated by Lockyer Valley Growers Inc. President Michael Sippel and Chris Rutland from Nutrien Ag Solutions. One of the first strategies to be developed by the committee was the Insecticide Resistance Management Strategy, which focused on preserving natural enemies and use of IPM compatible sprays, such as Bts, in an area wide approach to pest management.

Spray technology was another training initiative led by industry. Troy Parchert from Creekside Fresh hosted a dye night, facilitated by Leesa Beling from Nutrien Ag Solutions with guest presenters Matt Moyle from Nufarm and Department of Agriculture and Fisheries, Queensland (DAF, QLD) Senior Extension Officer Clinton McGrath. This involved a hands-on session looking at boom spray calibration and fluorescing dye trials to demonstrate the impact of water volumes, use of adjuvants and nozzle selection on spray performance.

Industry R&D

The region held a number of research and development initiatives that focused on diamondback moth. Jessica Page and Paul Horne from IPM Technologies and Lara Senior from DAF, QLD visited growers to discuss integrated pest management and share research findings from the strategic levy investment *Impact of Pesticides on Beneficial Arthropods* (VG16067).

John Duff's team at DAF, QLD demonstrated innovative monitoring and management options for diamondback moth, while Matt Crust from Crust farms assisted University of Queensland PhD candidate Jessa Thurman to conduct on-farm trials investigating flowering border rows as a nectar source for *Diadegma* to increase in-field parasitism.

Monitoring and evaluation conducted by myself and Clinton McGrath – on behalf of CropLife Australia – indicated that most growers were able to effectively manage diamondback moth in the 2019 season. However to achieve effective control, growers had to change their management strategies to include more Bts sprays and utilise beneficial insects.

Find out more R&D

Please contact VegNET Lockyer Valley RDO Zara Hall on 0456 956 340 or email ido@lockyervalleygrowers.com.au.

VegNET – Lockyer Valley is a strategic levy investment under the Hort Innovation Vegetable Fund.

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Hort Innovation Strategic levy investment | VEGETABLE FUND

The Art of Extraordinary Facilitator Genevieve Matthews.

VegNET at work: Role of women in horticulture

On 16 July, around 35 women participated in a 'virtual bus tour' hosted by Bundaberg Fruit & Vegetable Growers – which facilitates the VegNET Wide Bay-Burnett project – and Growcom. The tour presented women who worked in the region's horticulture sector with the opportunity to connect with their peers, and gain an insight into their achievements and challenges. BFVG Managing Director Bree Grima reports.

Queensland grows 44 percent of Australia's vegetables and supplies around 90 percent of its production during the winter months. The Wide Bay-Burnett region's vegetable production is valued at approximately $212,904,368 and provides around eight percent of the national total.

This figure only reflects the farm gate value, and not the actual people that are behind the statistics – and this is what interests us. *National Economics – Modelled Series* data for 2018/19 showed that agriculture in the Bundaberg Regional Council area, which is a sub-section of Wide Bay-Burnett, contributed 5.2 per cent of Queensland's employment. This supported over 3,000 families with work and another 4.9 per cent of the state's value-adding sector.

Queensland Farmers' Federation data released in 2019 revealed that women play a crucial role in the farm agribusiness. Women make up half the international agricultural workforce, and at times face constraints that reduce their contribution to the sector.

With this knowledge, we developed a one-day workshop designed to engage women in agribusiness to raise awareness of environmental outcomes, programs and research and development within the region. It focused on upskilling in social capacity building to empower these women to become greater decision-makers in their agribusiness.

Virtual bus tours

Coordinated by VegNET Wide Bay-Burnett and Growcom, the workshop was designed as a regional bus tour to water quality monitoring projects. However, this had to be adjusted due to COVID-19 restrictions – and this resulted in a surprisingly positive day of upskilling, empowering, and learning.

A video compilation was made with producers that have water quality projects and these were played at the workshop, along with other guest speakers. Approximately 35 women who work in horticulture attended the day, and many were vegetable producers. They were exposed to horticultural production systems in the region that demonstrate the range of on-farm practices being implemented to limit and reduce impacts on reef water quality, while maintaining production.

The video compilation was designed to capture producers' views on the role of women in horticulture, what the barriers and opportunities are and how their position is viewed. Check out the inspiring video on the Bundaberg Fruit & Vegetable Growers website at bfvg.com.au/news/women-in-hort-event.

Following the 'virtual bus tours', *The Art of Extraordinary* Facilitator Genevieve Matthews provided upskilling on business capacity building. This focused on resilience and empowering the workplace to encourage women to ask more questions and enhance their capacity as decision-makers. This section was very well-received, and was designed to help women in agriculture create thriving businesses. There was a focus on adapting to change and developing agribusinesses with short- and long-term resources.

Planning for the future

In other VegNET news, we have been working hard on developing a discussion paper and regional extension strategy that will outline potential projects and initiatives to enhance and support the vegetable industry. Key focus areas for the Wide Bay-Burnett region include waste management, biosecurity (pest management and resistance management), water and soil management, and value-adding opportunities.

We look forward to finalising this document and delivering projects that are relevant and meet the needs of the vegetable industry, including its growers, advisors, extension providers and other key stakeholders.

Find out more R&D

Please contact Bree Grima at bree.grima@bfvg.com.au or phone the BFVG office on 07 4153 3007.

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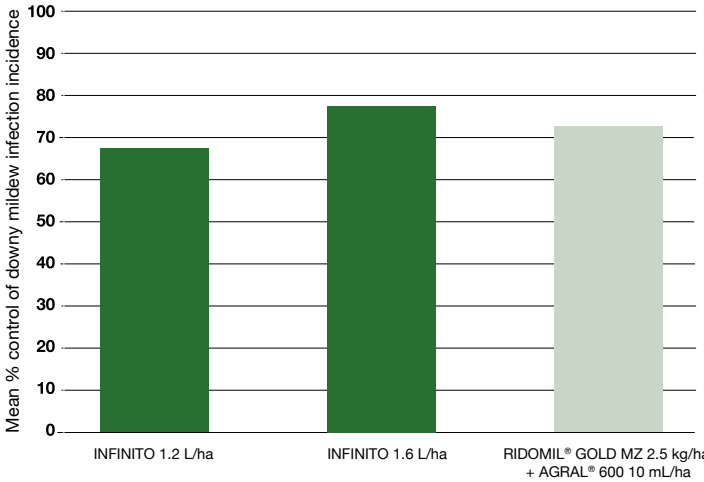
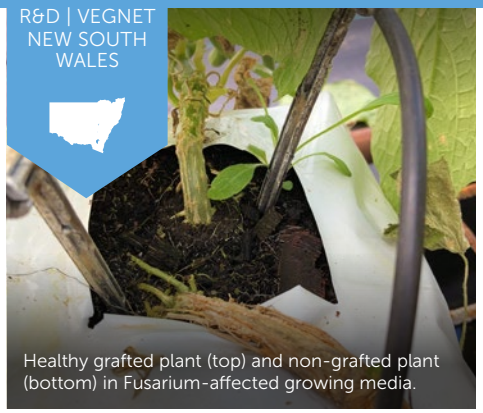
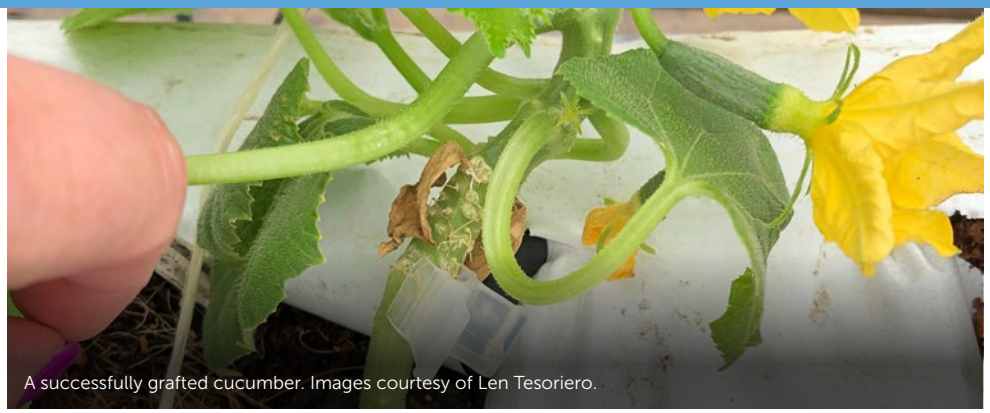


Data summary from 5 replicated trials.
Trial ref: FD12QB13, FD13QB18, FD13QB06, FD13QB05, FD14VB16.



Healthy grafted plant (top) and non-grafted plant (bottom) in Fusarium-affected growing media.



A successfully grafted cucumber. Images courtesy of Len Tesoriero.

Providing grower support across New South Wales

The VegNET New South Wales team is busily preparing for phase two of the extension project. It is looking to further identify knowledge gaps in research, and support vegetable growers in adopting on-farm practices. In this article, VegNET Regional Development Officer Sylvia Jelinek provides an example of how extension can address popular areas of interest and produce tangible results for vegetable growing operations.

The VegNET New South Wales project is expanding into a second phase after the team successfully secured funding to continue supporting NSW vegetable growers. With the current focus on developing a strategy to determine key focus areas for the industry, the team is calling on growers and other interested industry members to have their say on priority extension areas.

VegNET NSW Regional Development Officer Sylvia Jelinek said she looked forward to exploring new and exciting methods of engaging with growers.

"The success of VegNET comes down to the great input we've had from growers who are keen to hear about innovations in research, and explore how these innovations can be applied on their farm," she said.

Protected cropping in-focus

Ms Jelinek said protected cropping was a popular area of interest for phase two of the program.

"Greenhouse cucumbers was an area we looked into in partnership with plant pathologist Dr Len Tesoriero," she said.

This project explored the grafting of cucumbers to disease resistant rootstocks.

"Greenhouse cucumbers are affected by a number of diseases which can severely reduce yields. Fusarium wilt and Pythium root rot are the most important causes of losses across major production areas of Australia," Dr Tesoriero said.

"The strain of Fusarium affecting cucumbers in Australia is unlike any that occurs overseas. There are no commercial cucumber varieties resistant to this strain of Fusarium available."

Over a period of two years, Dr Tesoriero and his team evaluated cucumbers grafted onto resistant rootstocks for control of Fusarium wilt and Pythium root rot.

"Preliminary studies identified a cucumber rootstock (cv. Affyne) and a hybrid pumpkin rootstock (cv. Cobalt) as being resistant to Fusarium wilt and highly tolerant to Pythium root rot," Dr Tesoriero said.

"In two commercial-scale trials, we demonstrated that both rootstocks could support healthy plants that easily out-yielded ungrafted plants in the same house.

"In a winter crop there was a 29 per cent yield difference between a grafted treatment and ungrafted plants. This can easily translate into an economic benefit under high disease pressure after the increased cost of seedlings is taken into account."

"Of course, the benefit really depends on how much disease pressure there is and the cucumber wholesale price," Dr Tesoriero added.

Project results: Net benefits

In the winter trial, there was a 29 per cent yield increase with grafting and say, for example, the average cucumber yield is 7 kg/plant. That yield difference represents a saving of about 2kg/plant. If cucumbers are worth $2/kg, it translates to a saving of $4 per plant.

Now if the difference between grafted and ungrafted seedling costs is $2.50, there is still a saving of $1.50 per plant. Obviously, this number changes for the better if prices are higher and vice versa for lower cucumber values. Overall, it provides growers with an effective disease management option.

There were a few other issues and factors that were observed during the trials:

- Care needs to be taken when transplants are placed into media. This is to ensure the graft union is not buried too deep, so that roots do not form above the graft union and become infected by Fusarium.
- If plants are layered – or vine training is delayed – roots can form above the graft union, enter the medium and become infected.
- In a single trial over winter, the cucumber rootstock outperformed the pumpkin rootstock. Over summer, both rootstocks performed equally. This result probably should be repeated to validate this effect.
- It is possible to use two heads on grafted plants to off-set increased seedling costs. This may require other changes to crop management so should be done with caution.

For further details or to get involved in the VegNET NSW program, visit lls.nsw.gov.au/regions/greater-sydney/key-projects/national-vegetable-extension-network-nsw.

Find out more R&D

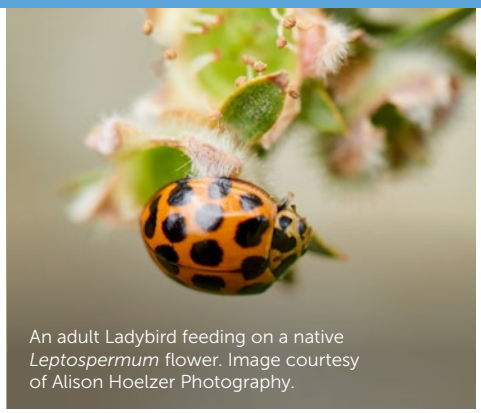
Please contact NSW Industry Development Officer Sylvia Jelinek from Greater Sydney Local Land Services on 0427 086 724 or sylvia.jelinek@lls.nsw.gov.au.

VegNET – New South Wales is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

Project Number: VG19011

Hort Innovation Strategic levy investment | VEGETABLE FUND



An adult Ladybird feeding on a native *Leptospermum* flower. Image courtesy of Alison Hoelzer Photography.

Example of before and after NVI plantings along a fence that otherwise did not serve as a productive space on-farm. Image courtesy of the Port Phillip and Westernport Catchment Management Authority.

R&D | VEGNET VICTORIA (SOUTH-EAST, WEST & NORTHERN)

Native vegetation insectaries: Benefiting vegetable growers and communities

The Port Phillip and Westernport Catchment Management Authority, with the support of the VegNET Victoria (South-East, West and Northern) team, is working with growers in the Werribee area to establish three native vegetations insectaries to showcase the benefits on and off-farm. VegNET Victoria Regional Development Officer Hugh Wardle provides an update.

What is a native vegetation insectary?

Native vegetation insectaries (NVIs) are vegetated areas of flowering plants that can provide habitat and a nectar food source for beneficial insects. This can support biological control of insect pests and reduce damage to vegetable crops. By repurposing areas on or within 50 metres of your farm that are not suitable for cropping, insectaries can be a simple and low-cost way to support an existing Integrated Pest Management (IPM) program.

Boosting IPM programs

The goal of NVIs is to enhance the diversity and abundance of beneficial insects by planting flowering native species. Insectaries build resilience in an IPM program – particularly against seasonal variations and new pest incursions – by attracting beneficial insects, allowing them to persist in the area for longer by providing habitat and food sources.

There are some cost-saving elements as well, particularly if you buy and release beneficial insects as many of these species need pollen and/or nectar to survive and reproduce as adults. These include common beneficials such as ladybirds, lacewings, hoverflies, and wasps. Subsequently, insectaries can maximise the benefits gained from these tiny pest-busting champions.
Depending on the crop type and timing, beneficials may also lay their eggs in an insectary or even shelter from certain crop activities such as harvest.

Insectaries for mutual benefits

Through the Victorian Government's 'Working for Victoria' initiative, the Port Phillip and Westernport Catchment Management Authority (PPWCMA) established a work crews project to support farmers and growers to improve their sustainability credentials, while providing employment to Victorians.
The work crews will be helping establish the NVIs and support the IPM programs of three local growers in Werribee, west of Melbourne. This will provide environmental benefits associated with native revegetation and reduced pesticide use, as well as create social benefits through employment opportunities.

VegNET Victoria (South-East, West and Northern), delivered by RM Consulting Group (RMCG), is supporting the initiative through monitoring the benefits of NVIs to the growers; developing case studies to demonstrate benefits to a wider audience; and liaising with relevant authorities, industry initiatives and vegetable levy-funded research to maximise impact.
This means improved expertise, efficiency, and potential benefits of NVIs through collaboration and knowledge brokering.
Building on early interest from three growers in the Werribee region to develop insectaries, the focus of this initiative is to demonstrate, quantify and broker the economic, environmental and social benefits to growers that can be realised from NVIs.

A key outcome of this initiative is active collaboration between research, public and private institutions. This will involve AUSVEG; vegetable levy-funded projects, including the project team from Charles Stuart University delivering *Field and landscape management to support beneficial arthropods for IPM on vegetable farms* (VG16062); water authorities; and growers. Works are expected to begin by early September.

Practical resources

For information on how to create an insectary on your own farm – as well as a suggested species planting list – please visit the AUSVEG VIC and the PPWCMA websites: ausvegvic.com.au/crop/native-vegetation-insectaries-permanent-habitat-for-beneficial-insects and ppwcma.vic.gov.au/what-we-do/past-projects/native-insectarium-trial.

For more about PPWCMA's work crews project, visit ppwcma.vic.gov.au/workcrews.

Find out more R&D

For further information, including expressing interest to trial insectaries on your farm, please contact VegNET Victoria Regional Development Officer Hugh Wardle on 0427 109 057 or hughw@rmcg.com.au.

VegNET – Victoria (South-East, West and Northern) is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

Project Number: VG19012

Hort Innovation Strategic levy investment | VEGETABLE FUND

From L-R: SA grower Hung Nguyen, Primary Industries and Regions SA Project Officer Michelle Carr and VegNET SA RDO Yanyu Liang.

Extension update: Full steam ahead for South Australia

AUSVEG SA is the state-wide representative body for South Australia's $700 million vegetable industry. It works with governments at all levels to advocate on key issues and delivers a number of key industry development programs, which include facilitating VegNET SA – an investment that keeps vegetable growers informed about current R&D activities, results and resources. VegNET SA Regional Development Officer Yanyu Liang provides an update.

Salinity in the spotlight

In recent years, salinity has been a key issue in South Australia. It has particularly affected areas such as the Northern Adelaide Plains, where it has caused significant land damage and crop losses.

With support from the Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLR NRM) and RM Consulting Group, AUSVEG SA hosted a series of webinars in June with national experts covering all aspects of salinity management.

The expert session online was delivered with a focus on irrigation management, salinity and crop nutrition, and recordings are available online from the Soil Wealth website: soilwealth.com.au.

As part of the project, Dr Doris Blaesing will be available to work with growers following the session to trial new management practices to address specific on-farm issues.

In addition, AUSVEG SA partnered with Dr Blaesing to develop a salinity guide for South Australian vegetable growers. The guide outlines several key concepts, such as identifying and managing salt stress in crops, salt tolerances of potential cover crops and management techniques for growers and advisors for managing salinity in South Australian conditions.

To access an electronic version of the guide or to receive a hard copy, please contact AUSVEG SA on the email addresses provided below.

'Clean Your Farm': biosecurity focus

The 'Clean Your Farm' project has been run as a partnership between Biosecurity SA and AUSVEG SA as a means of supporting growers with the management tools and resources necessary to protect their business against biosecurity incursions.

The design for a new biosecurity program under Clean Your Farm is in progress. The team plans to work closely with industry to roll-out biosecurity guides and resources, and support growers with additional waste management initiatives.

Showcasing veg growers

AUSVEG SA has developed a series of 'Sustainable Success Stories' to showcase the efforts of South Australian growers who have adopted new growing or management practices.

The series was developed with support from the Adelaide and Mount Lofty Ranges NRM Board to highlight growers in the region who had adopted new growing or management practices, and sharing these local success stories more broadly with government and industry.

Planning activities

Under AUSVEG SA's management, the VegNET project in SA has engaged with the South Australian vegetable industry. In the initial stages of phase two, AUSVEG SA participated in the training facilitated by Hort Innovation. This looked at understanding the innovation systems-approach under the new project and participating in the mentorship process to develop the new regional extension plan.

For now, we have selected and convened the Regional Extension Reference Group and commenced development of the Regional Extension Plan incorporating an innovation systems-approach.

The initial project plan has comprised the majority of project activities from the period spanning 1 April to 1 July 2020, and much of the project's focus will be around developing the project plans and strategy to guide the period following.

The focus areas include, but are not limited to:

- Working with AUSVEG SA management to scope and deliver programs in LEAN manufacturing, energy efficiency and waste management efficiency.
- Scoping new training opportunities.
- Liaising with growers.

Find out more R&D

Please contact AUSVEG SA CEO Jordan Brooke-Barnett at jordan.brooke-barnett@ausveg.com.au or VegNET SA RDO Yanyu Liang at yanyu.liang@ausveg.com.au.

VegNET – South Australia is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

Project Number: VG19015

Hort Innovation Strategic levy investment | VEGETABLE FUND

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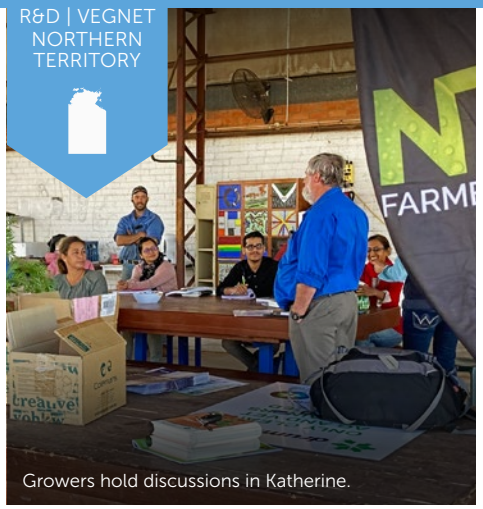

Growers hold discussions in Katherine.

Katherine Food Ladder – Harvest 2020. Images courtesy of NT Farmers Association.

Katherine vegetable growers unite to plan ahead

Regional vegetable producers in Katherine, 320km southeast of Darwin in the Northern Territory, recently had an opportunity to participate in a discussion about the challenges, problems, and opportunities they believe are at the forefront of their production systems. VegNET Regional Development Officer Simone Cameron provides an overview.

This timely meeting of local Katherine producers is in line with the commencement of *VegNET Phase 2*, which is focusing on the development and implementation of a Regional Strategic Plan for 2020-2025. It aimed to identify and prioritise key regional issues that will support our vegetable growers to grow healthy crops, and to develop successful and profitable businesses.

The Northern Territory is one of the younger regions for horticulture and vegetable production in Australia. There is a need in this developing region to engage with growers to build relationships for improved best practice. The area around Katherine is well-positioned to grow a variety of vegetable crops during the months of April through to September, meeting national and export market demands for produce that cannot be grown in the southern states over the winter months. Pumpkins are the major crop along with zucchinis, tomatoes, eggplants, capsicums, and asparagus.

Water in-focus

The region experiences two very distinct seasons: Wet and Dry. Typically, the Wet Season runs from December through to the end of April when the total annual rainfall is met. The remainder of the year is the Dry Season, when no rain is experienced – and this ideal for vegetable growers.

The last two Wet Seasons have been particularly poor, and the 2019-2020 season was well-below average. We have also experienced extended above-average temperatures, which has seen many growers adjusting their on-farm management practices to ensure that the seasonal produce can be productively and economically grown. The region has been placed on a water allocation plan for this growing season, which was based on their previous season's use as well as groundwater aquifers not receiving adequate annual recharge. The water allocation plan has presented several challenges for many Katherine growers, with most choosing to plant less this season as a result.

Supporting regional development

Through previous project findings, it has been recognised that continual and regular engagement is needed to reassure growers of our ongoing support. Growers see this as value-adding to their business practices.

Considering this, NT Farmers Association Industry Development Manager Greg Owens and I met growers, researchers and industry specialists to discuss and prioritise the key issues for the Katherine region to enhance and support its future development.

The focus group was held at Katherine's Food Ladder hub, a point of interest for many locals in the region. Food Ladder Horticulture and Training Manager Scott McDonald was pleased to offer the site for the session.

"It's great to have and see industry collaboration in the region," Mr McDonald said.

It was an opportunity for Food Ladder to showcase its hub as a source of locally grown, sustainable and valuable products. It is also a key reminder for everyone that fresh, locally-grown produce provides great value to any community.

Growers were very interested in the on-site climatically controlled greenhouse system, highlighting the potential for a protected cropping development in the north.

Other key areas discussed were water and water efficiency practices; understanding and improving soil health to assist with productivity; the implementation of Integrated Pest Management practices to reduce the amount and reliance on conventional practices; as well as establishing better supply connections between growers, local and remote community stores and the hospitality industry in the Top End.

The focus group was a wonderful opportunity for our levy payers to engage in what they value as important for the long-term sustainability of the industry. The key messages from this session will assist with developing a bank of potential project opportunities that can be rolled out with the emphasis being on high stakeholder engagement and delivery.

Find out more R&D

Please contact Simone Cameron at bio@ntfarmers.org.au

VegNET – Northern Territory is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

Project Number: VG19017

Hort Innovation Strategic levy investment | VEGETABLE FUND

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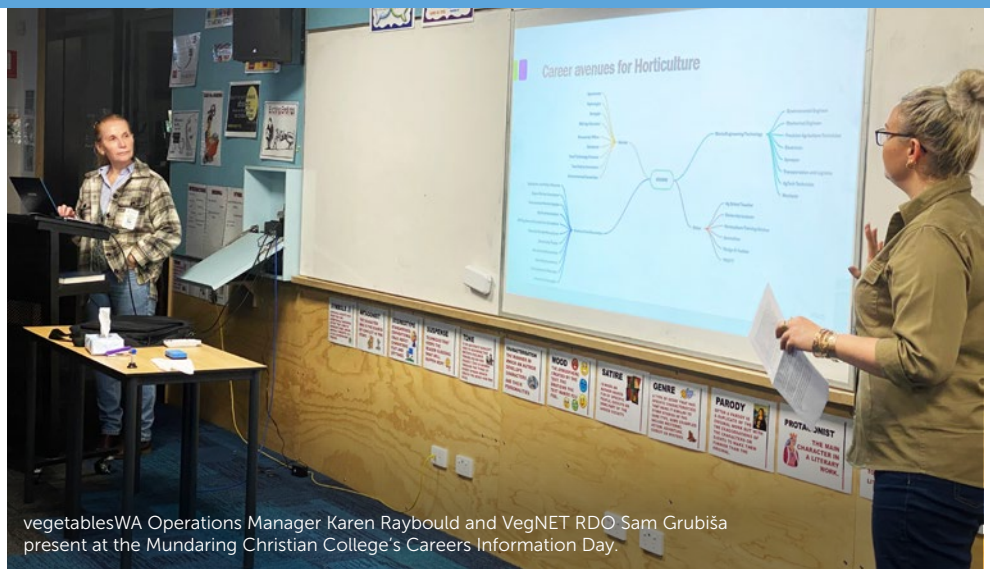
Green peach aphid
(Myzus persicae)

Grey cabbage aphid
(Brevicoryne brassicae)

Silverleaf whitefly
(Bemisia tabaci biotype B)

VegNET RDO Sam Grubiša.



vegetablesWA Operations Manager Karen Raybould and VegNET RDO Sam Grubiša present at the Mundaring Christian College's Careers Information Day.

A view from the west: Adapting to a new world

In this column, VegNET Regional Development Officer Sam Grubiša discusses the effect COVID-19 has had on the world, the activities that have been undertaken during and after lockdown, and how WA's growers are being supporting during these tough times.

After an all-round tough end to 2019, the promise of a new year rejuvenated all who were touched by the magical, golden rays of summer sunshine.

As drought-stricken farmers finally got a little rain and the amazing men and women, who eventually tamed the beast of Mother Nature's fury of fire, were released from duty, we all breathed a little easier as we faced a new day on his big, beautiful brown land of ours. That was until 2020 stood up, stretched, cracked its knuckles, and said, "hang on a sec... hold my Corona!"

With 2020 trying its best to out-do its predecessor, it makes me proud to be part of an industry that a) refuses to curl up in a corner and cry; and b) continues to produce superb, health sustaining fresh produce to feed a nation in need.

While being a grower in today's 'COVID new world' isn't all rainbows and lollipops; whether you're Vietnamese, Croatian or generationally Australian, you adhere to the virtues synonymous with the beloved 'Aussie battler'. An insurmountable ability to improvise, survive and a hint of the anti-authoritarian is what pushes these great men and women to continue providing for their neighbours, communities, and country.

As VegNET Regional Development Officers, Truyen Vo and I have been busy working on the VegNET Regional Strategy, as well as sourcing relevant work, health and safety (WH&S), business and trade information to add to our organisation's COVID-19 resources page.

However, we are both aware that 'The Farm Stops for No Man...or virus', so we've been trolling through national and international research, holding webinars, translating documents (okay, that's more the legendary Truyen than me!), searching permits and working out how we can support our growers best in this time of isolation.

Recent activities

During WA's lockdown, we held a biosecurity webinar with AUSVEG's Callum Fletcher and Maddy Quirk along with Michelle Portelli from Hort Innovation. This focused on tomato-potato psyllid, fall armyworm and Michelle's appointment as International Year of Plant Health – Events Coordinator. As always, it was a delight to catch up with the 'brains trust' of Aussie biosecurity.

Post-WA lockdown, we had the wonderful Dr SP Singh from the New South Wales Department of Primary Industries join us for a webinar update of all things melon safety. That webinar went international – a win for extension and food safety!

Within vegetablesWA, we have been supporting Labour Facilitator Melissa Denning with grower introductions and language assistance and we've been working on accreditation courses with the Quality Assurance Coordinator Joel Dinsdale.

In early August, I also had a fun morning in "The Hills" with vegeteblesWA colleagues Karen Raybould and Amber Atkinson, after we were asked to present at Mundaring Christian College's Careers Information Day. As a truck driving farm girl, I had my concerns about speaking to a group of 15-18-year olds. I shouldn't have worried as the kids were engaged and surprised me with their knowledge and correct answers to my 'Sneaky Hort Facts'.

The final word

COVID-19 has hit hard on a global scale, and it's important (for your own sanity) to find little things to make you smile.

As I write this – with a million tabs open on my computer, a pen in my hair and surrounded by strategy documents – I smile when I look outside, and see the sun shining and brilliant blue sky.

Spring brings with it the reawakening of nature and the promise of new life, and boy are we living a new way of life! Dedication, perseverance and a spare pair of trackies in the ute may not protect you from a virus; however, in my mind, they are three things that are essential to pushing through the hard times that we find ourselves in.

Keep safe, stay strong and find a reason to smile!

Find out more R&D

Please contact Sam Grubiša at sam.grubisa@vegetableswa.com.au

VegNET – Western Australia is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

Project Number: VG19016

Hort Innovation Strategic levy investment | VEGETABLE FUND


VegNET RDO Ossie Lang.


A cover crop demonstration site at Houston's Farm in Richmond, Tasmania.

Regional focus for Tasmania's VegNET team

Under the guidance of new Regional Development Officer – Ossie Lang – phase two of the VegNET Tasmania project is well-underway. In this column, the VegNET Tasmania project team reports on its priorities over the next five years.

A new look for VegNET Phase 2

The VegNET Tasmania team has developed a regionally-focused extension plan for the vegetable industry for the next five years.

With the diversity of crops grown in Tasmania, and the diverse operations in which these crops are grown, activities will be tailored – and the team is working with local organisations for the benefit of local vegetable growers.

Project priorities

Broadly speaking, our focus areas fall in to two overall categories: 'cost of production' and 'risk management', and include the following topics:

- Labour.
- Precision agriculture and other technologies.
- Waste management.
- Business management.
- Crop protection.
- Biosecurity.
- Soil and input management.
- Climate risk management.
- Activities will be tailored for Tasmania's regions. With the diversity of crops and growing conditions within the state, we will be offering more focused activities within the state in a more regionally- aligned way.
- North-west Tasmania – crops grown on contract for processors and packers, and grown in vegetable cropping systems alongside other crops including potatoes, onions, pyrethrum and poppies.
- Northern Tasmania – working with processing peas, beans and other vegetable growers on mixed farms.
- Southern Tasmania – mainly leafy vegetable crops, with a focus on fresh market supply.

Our activities will focus on coordinating training and assisting individuals and grower groups with support in implementing farm planning and decision-making tools.

Training coordination

Having a skilled workforce can save your business money. VegNET Tasmania can coordinate training if there is sufficient demand, e.g. training for supervisors. Contact Ossie Lang on the below details if you have already identified training needs in your business.

Biosecurity

We are planning to work with industry to prepare for the implementation of the new Tasmanian Biosecurity Act, and the implications for vegetable growers and service providers.

Herbicide resistance

We would like to work with growers and agronomists to minimise the risk of herbicide resistance. We will be working with growers and agronomists to better understand the potential issues and ensure we are on the front-foot to minimise the risk.

Contact your Regional Development Officer

VegNET RDO for Tasmania Ossie Lang joined the team in July. Ossie is responsible for working with industry and growers to coordinate and extend research results, resources, available courses, and relevant events. Ossie is keen to hear from growers, and to discuss their priorities for VegNET Tasmania.

Find out more R&D

Please contact Ossie Lang on ossiel@rmcg.com.au or 0430 380 414.

Follow us on social media: Facebook: @VegNET.Tas and Twitter: @VegNET_Tas

VegNET – Tasmania is a strategic levy investment under the Hort Innovation Vegetable Fund.

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

Project Number: VG19014

Hort Innovation Strategic levy investment | VEGETABLE FUND

Hort Innovation launches The Good Mood Food campaign to boost fruit, veg and nut consumption

In response to the impact of the COVID-19 pandemic on fruit, vegetable and nut consumption and the corresponding effect on mental health and well-being, Hort Innovation launched a widespread marketing campaign across print, broadcast and social media to encourage Australians to buy more fresh produce. Hort Innovation provides an overview of the campaign and some early data to measure its success.

Hort Innovation developed the Good Mood Food initiative to support the horticulture sector through the effects of the COVID-19 pandemic, which continue to be felt in consumer spending and purchasing behaviour. The bold new marketing campaign motivates more people to consume more fruits, vegetables and nuts more often, with the message that when you eat better, you feel better.

What is The Good Mood Food?

The Good Mood Food campaign is delivering an immediate and enduring behaviour-change message to motivate more Australians to eat more fruit, vegetables and nuts, both during and beyond the COVID-19 pandemic.

It is a direct-to-consumer marketing initiative playing out across the country using a range of channels, including TV, newspapers, radio, online, social media and retail partnerships.

The Good Mood Food's central message is that fresh Aussie fruit, vegetables and nuts are natural mood boosters. The campaign is encouraging people to "eat on the bright side" – eating a wide variety of fresh and vibrant horticultural produce to look after themselves mentally, as well as physically.

The Good Food Mood features TV ads that appear across metro and regional TV (and catch-up services) during high-rating programs including *Seven News, The Project* and more. Ads are also placed that directly link to 'good mood moments' in popular shows such as *MasterChef Australia, Have You Been Paying Attention*? and *Farmer Wants A Wife*.

The Good Mood Food website (thegoodmoodfood.com.au) acts as a central spot for campaign messages and materials, with links to recipes and inspiration from a host of industries. As the campaign continues to develop, the website will come to include health information, fact sheets and more.

The Good Mood Food has a strong focus on social media on Facebook (@thegoodmoodfoodaus) and Instagram (@thegoodmoodfoodaus).

Hort Innovation's marketing team is also working on activities with retailers, as well as out-of-home advertising focusing on digital screens in close proximity to grocery shops. It's expected that the campaign will reach up to 98 per cent of Australians through its combination of advertising, public relations, social media and media and retail partnership activity.

Latest campaign stats – August 2020

Since the start of the campaign in May to August 2020, the campaign has:

- Reached 18,407,687 Australians – that's 88 per cent of the total population.
- Has driven 49,949 people to the website.

Through a partnership with Newscorp Australia, whose portfolio includes national, metropolitan, regional, community and specialist multi-platform brands, Hort Innovation reached audience of 608,286 people, with an average frequency of 7.6 times.

A vegetarian dinner recipe article across the Taste website (taste.com.au) drove a particularly high engagement.

More detailed statistics that covers the entire campaign will be shared by Hort Innovation after the completion of the campaign.

Find out more R&D

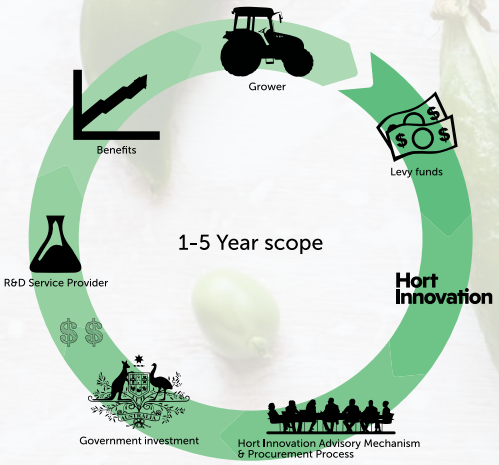
For more information on The Good Mood Food campaign, please visit thegoodmoodfood.com.au.

The Good Mood Food activity is funded through Hort Innovation's risk management reserves, as part of the company's response to assist the horticulture sector through the effects of COVID-19, drought, floods and bushfires.

Hort Innovation

THE VEGETABLE R&D LEVY AT WORK

STRATEGIC LEVY INVESTMENT



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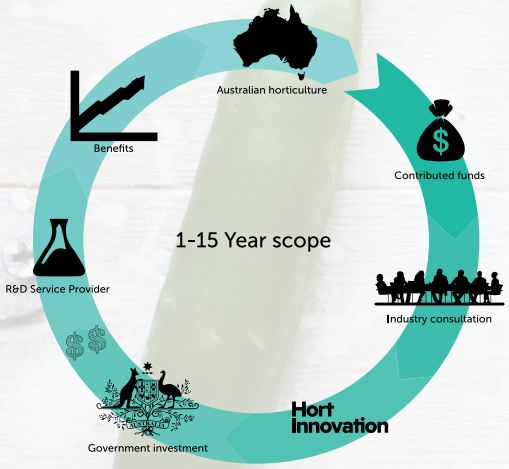

WHO PAYS THE VEGETABLE R&D LEVY?

The levy is paid by growers who produce and sell vegetables in Australia. The charge is set at 0.51 per cent at the first point of sale. The Federal Government also provides funding in addition to grower levy payments. Once paid, the research and development levy funds are managed by Hort Innovation.

HOW IS LEVY MONEY INVESTED?

Hort Innovation has two funding models for investment in research and development. The industry's levy is invested with Australian Government contributions through the Hort Innovation Vegetable Fund, which is part of the organisation's strategic levy investment activities.

All investments through the Vegetable Fund are made with advice from the industry's Strategic Investment Advisory Panels (SIAPs) – skills-based panels made of panellists from across the vegetable industry, the majority of whom are levy-paying growers.

Strategic levy investments have a one- to five-year scope and the R&D is designed to directly benefit growers in the vegetable industry. Project topics range from pest and disease management to biosecurity matters, with findings communicated through a variety of channels, including *Vegetables Australia*.

You can find information on all current strategic levy investments, and details of the SIAP, on Hort Innovation's Vegetable Fund page at **horticulture.com.au/growers/vegetable-fund/**.

The second Hort Innovation funding model is the strategic partnership initiative known as Hort Frontiers. Hort Frontiers projects do not involve levy dollars, unless an industry chooses to become a co-investor in them, through advice of the SIAP. Instead, Hort Frontiers facilitates collaborative across-horticulture projects involving funding from a range of co-investors. These projects have a long-term focus and are designed to solve major and often complex challenges to secure the future of Australian horticulture.

You can read more about Hort Frontiers and the seven funds within it at **hortfrontiers.com.au.**

HOW CAN GROWERS GET INVOLVED?

All vegetable growers are encouraged to share their thoughts and ideas for the research they want to see, both within the levy-specific Vegetable Fund, and within the wider Hort Frontiers strategic partnership initiative.

Ideas can be submitted directly to Hort Innovation through the online Concept Proposal Form at **horticulture.com.au/about/investing-is-our-business/concept-proposal-form/.** Growers are also encouraged to reach out to the SIAP panellists for the industry (available from the Vegetable Fund page).

Hort Innovation Strategic levy investment | VEGETABLE FUND

This project has been funded by Hort Innovation using the vegetable research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au

Project focusing on end-to-end traceability commences

The Kenrose label on a product.

The Australian Government has announced further investment in an advanced blockchain traceability system that will help to protect the country's clean, green, and safe food image, and boost export opportunities for growers. *Vegetables Australia* investigates the traceability benefits for Australia's vegetable growers.

Tracing and tracking produce beyond the farmgate is more important than ever, with increasing complexities in the supply chain and rapidly evolving regulatory systems. FreshChain Systems is leading a pilot traceability project funded by the Australian Department of Agriculture, Water and the Environment (DAWE) and supported by the NSW Department of Primary Industries.

The aim of this project is to enable the adoption of a blockchain-based end-to-end traceability system in the horticultural supply chains in domestic and export sectors. The leading experts in food safety, traceability and marketing are collaborating on this project to ensure the traceability solution exceeds expectations of growers, traders, consumers, and regulators. The technology will help protect the Australian brand in domestic and export markets.

Modern, accurate and timely traceability systems provide assurances to trading partners and consumers about the safety and quality of the country's produce. Digital end-to-end traceability also ensures improved freshness in products, ultimately reducing food waste.

The system is designed for easy adoption, effective with deep consumer insights and low cost so any grower can participate, irrespective of size or current system digitisation.

"Our goal is to help build a resilient fresh food supply chain by giving justified assurance to all partners in the supply chain," FreshChain Systems Director Greg Calvert said.

"By doing so, we can open up new domestic and export opportunities for growers and help build reputation as a provider of fresh and safe food to the world."

Case study: Introducing Kenrose Co to consumers

Ken and Sonia Duncan operate Kenrose Co, producing a variety of pumpkin and seedless watermelon in Ayr, located in northern Queensland's Burdekin region.

The FreshChain team has been working remotely with Kenrose Co to develop a business showcase and the end-to-end trace elements. It has been providing support to create a video of the farm, the region, and introduce the Duncans to consumers.

"We delivered the training via an online platform in a couple of hours and were available as required with any questions they had – the beauty of technology," Mr Calvert said.

"Ken and Sonia are keen to show their farm and their produce as well as give an insight into the Australian farming life. They see it as an opportunity to showcase the origin of their produce and why it is best in class."

In addition, the Duncans wanted to educate consumers about their pumpkin and highlight its cooking versatility; health and nutritional benefits; how to store it correctly to reduce food waste; and even offer recipe suggestions.

"Ken and Sonia are excited about the deep consumer insights they will receive and learning more about who their customers are, how they rate the product and what they would like to know," Mr Calvert said.

"It is also a chance to compare varieties. They see this as an opportunity to open up new markets, both locally and abroad, and in doing so, get more people eating pumpkin as part of their weekly cooking habit."

Mr Calvert said consumers simply want to know more about the food they eat.

"We know consumer insights are highly valued as is the ability to quickly respond to issues; further digitisation across the supply chain will deliver this outcome. Our role is to make it easy, make it effective and make it affordable for all."

Find out more

Please contact Greg Calvert at gcalvert@freshchain.com.au or visit freshchain.com.au.

Pilot project: Expressions of interest now open

FreshChain Systems is inviting horticultural growers, packers, wholesalers, and exporters to participate in the pilot project.

Through their participation, businesses will experience the benefits of a cost-effective and robust traceability system that will help to remain a leader in the market and compliant with the regulatory systems. To express your interest, please visit forms.gle/a8JLTj16wqgiHK6f9.


Ken Duncan in the field with one of his team.

Johann Joubert hosting AUSVEG Reverse Trade Mission participants from Japan in February 2019. Image courtesy of the Tasmanian Fruit & Vegetable Export Facilitation Group.

Assisting vegetable growers to achieve their export goals

Export Facilitators (VG16085) is a strategic levy investment under the Hort Innovation Vegetable Fund, and is designed to increase Australian vegetable exports by supporting growers to capitalise on commercial business opportunities. In this article, export facilitators share the stories of two growing operations that have benefited from the project and vegetable industry export resources.

Case study 1: Tassie Pride Glasshouse – Lillico, Tasmania

Dr Johann Joubert is the CEO of Tassie Pride Glasshouse. In this case study, Johann explains the business and how the Export Facilitators project assisted it in export market preparations in 2019.

Out of adversity – following identification of a fruit fly outbreak nearby to Johann's capsicum hothouses in 2018 – came opportunity as domestic supply chains were reviewed, and counter measures were strategised to reduce or remove market weaknesses.

Tassie Pride needed to ensure that it was able to supply markets that would accept its capsicums without compromising quality or speed to market. Once the fruit-fly suspension zone control area was lifted in early 2019, Johann engaged with Tasmanian Vegetable Export Facilitator Ian Locke to identify export opportunities and potential markets.

International connections

As a first step to better understanding the interaction with overseas buyers, a visit to Tassie Pride was arranged during the AUSVEG Reverse Trade Mission from Japan in February 2019. Due to quarantine restrictions, Tasmania is the only state in Australia permitted to supply capsicums, eggplants and cucumbers to Japan.

Following discussions in Tasmania, the Export Facilitator gathered further on-location market information and held discussions with importers at FOODEX Japan in March 2019.

As Tassie Pride gathered further information, a database of knowledge was built. It studied supply chains to international destination, reviewed packing and packaging options and investigated product quality specifications

"Researching markets and your ability to supply them competitively is not an overnight project. You have to consider all options and adapt them to your business," Johann says.

The next step in the export journey was to attend the 2019 Asia Fruit Logistica with AUSVEG and other vegetable levy-payers. Held every year in Hong Kong in September, AUSVEG provides emerging vegetable levy-paying exporters with the opportunity to build their international market knowledge and network with their Australian and international peers.

"This was a tremendous opportunity for Tassie Pride. The AUSVEG export team was fantastic and ensured that I had great touchpoints at every stage," Johann says.

While the initial focus has been on Hong Kong and Singapore, the important high-level strategy has been to bolt exporting onto its existing Australian business. Its current focus is Australia but as production increases, new markets will have to be developed. Tassie Pride is building a new hothouse facility, and combined with modifications to their Lillico base, production will be from August to June.

"We will always support our key Australian customers because, in many ways, they are our partners – and have been for over a quarter of a century," Johann says.

After talking through options and initial export planning, two members of Tassie Pride's management staff are set to attend an AUSVEG export readiness workshop later this year.

Throughout the export journey, Tassie Pride has sought support from the resources provided by the Export Facilitator project in Tasmania. No one company works in isolation, and assistance from AUSVEG, Hort Innovation and other exporters has been important and rewarding.

"Progress has been cautious. It has been great to have the support of Ian Locke, who provides the network and links to build our own capabilities and engage with the retailers in south-east Asia," Johann says.

COVID-19 impact

Since January 2020, Tassie Pride has had to put export development on hold due to COVID-19. Developing new export markets requires speedy, direct and capacity for small shipments by air in the early months of development.

"Singapore and Hong Kong were significantly impacted in February and March and following closure of the Australian border, airfreight came to a standstill; particularly for small volumes of highly perishable vegetables, such as our capsicums," Johann says.

Other target markets such as Japan experienced a strong drop-off in demand for food service, and it will be sometime before relationships can be rebuilt with →

WA vegetable growers at the FOODEX Trade Show Japan in March 2019 (L-R) Jim Trandos (WA Corn Growers), Richard Hunt (Sumich), Patrick Fox (Fox Farms) and Pennie Patane (Patane Produce).

Bins of Chinese cabbage loaded in a refrigerated container for export.

Chinese cabbage (wombok) packed for export. Images courtesy of vegetablesWA.

importers. FOODEX 2020 was cancelled and at the time of writing, there is still doubt as to whether Asia Fruit Logistica will be held this year in Singapore.

In Tasmania, the Export Facilitators project has continued to maintain contact with fresh vegetable producers through multi-digital communication channels and newsletters. As Tasmanian restrictions are eased, it will become easier to meet with growers and identify barriers to export post-COVID, as well as determine pathways to the new/next normal export markets. While some issues are still nebulous and unknown, we will continue to work towards the other side.

Case study 2: Fox Farms – Scott River, Western Australia

When tomato-potato psyllid was found in Western Australia in February 2017, Fox Farms had $250,000 of potatoes prepared for export. With the risk of reduced export opportunities for potatoes from WA, Fox Farms made the decision to diversify its business and start growing vegetables for export.

The Fox family has been farming in southern WA for three generations and has strong connections in Singapore, so it started exploring export opportunities for vegetables.

Patrick and Shannon Fox and their three daughters are from Scott River, 300 kilometres south of Perth. The abundant water, and mild climate, makes it a great place to grow potatoes and vegetables year-round. The main crops grown are Chinese cabbage (wombok), broccoli, celery and potatoes. Patrick and Shannon have another farm – including a packing facility – in Yarloop, where they grow potatoes and pumpkin. Fox Farms works with several other growers in different regions of WA who grow vegetable lines outside their production window, so that they can supply export customers year-round.

"Export gives us the potential to grow and expand our business beyond the local WA market. We can produce large volumes of vegetables very well, such as Chinese cabbage, so it would be easy to flood the local WA market," Patrick explains.

"Our export customers can sell large volumes in Singapore and offer us a consistent price for the whole year. While the price isn't as high as the domestic price at times, it also doesn't drop as low and allows us to budget and operate at an efficient scale.

"With export, we're not planting and

hoping we make money – we already have the price agreed before it's in the ground. Unless there's a crop failure, we know we will be profitable."

Building knowledge

In October 2018, Patrick and Shannon attended an export workshop in Perth that was arranged by vegetablesWA as part of the Export Facilitators project.

"Through the export workshop, we learnt quite a bit and got to meet other WA growers who are exporting," Patrick says.

"Hearing from people like Jim Trandos and getting a better understanding of how air freight works was valuable. We also got to meet Michael Coote from the AUSVEG Export Development project, and since then we have been involved in the AUSVEG overseas trade activities."

This includes the FOODEX trade show in Japan in March 2019.

"Attending the trade show was a real eye opener for us. There was quite a bit of preparation before we went but vegetablesWA and AUSVEG were helpful," Patrick says.

"From helping us polish up our company brochure, through to organising introductions to Japanese importers before we travelled to Japan and arranging the market insights tour – it was a very worthwhile experience."

Forging connections

At FOODEX, Patrick met importers who were particularly interested in the Kabocha pumpkin that he had just started growing.

"We sent some samples of the Kabocha to a couple of importers and they were impressed with the quality. Our supply window fits in nicely between the local Japanese supply and other countries, such as Mexico and New Zealand. It's exciting to be breaking into a new market with so much potential," he says.

Export already makes up 90 per cent of the Fox Farms business but the volume of exports has grown significantly in the past 12 months. During the 2018/19 financial year, exports have increased by about 300 per cent with 400 shipping containers of produce exported by the business. Each container is 40-feet high.

Patrick and Shannon are happy with their business direction.

"Our plan is to build on what we have and scale up production of the lines that we are already growing. We're keen to look at some new markets – potentially the Middle East – and start dealing directly with retailers in new markets," Patrick says.

• The Fox Farms case study has been provided by vegetablesWA, and first appeared in the autumn 2020 edition of *WA Grower* magazine.

Find out more R&D

For more information about the Export Facilitators project or to get involved in export development activities in WA, please contact Manus Stockdale at manus.stockdale@vegetableswa.com.au or on 08 9486 7515. Tasmanian growers who would like further details, please contact Ian Locke at ian.locke@tasfruitveggroup.com.au or on 0438 911 319.

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

Project Number: VG16085

Hort Innovation Strategic levy investment | VEGETABLE FUND

Commodity Profile:

Brussels sprouts

5,733 tonnes

of Brussels sprouts were produced at a value of AU$19 million, with 18 per cent sent for processing in the year ending June 2019.

Source: Australian Horticulture Statistics Handbook 2018-19

33%

of Australia's exported fresh Brussels sprouts were to South Korea. Australia. Australia is a net exporter of Brussels Sprouts and for the year ending June 2019, exported 365 tonnes.

Source: Australian Horticulture Statistics Handbook 2018-19

Ancestors of Brussels sprouts were cultivated in ancient Rome and appeared in Belgium in the 13th century, which is where it is believed the vegetable acquired its name.

Source: The Better Health Channel

The *Australian Horticulture Statistics Handbook 2018-19* reports that Brussels sprouts are grown in the southern states of Australia, with the largest producing state being South Australia. The major growing regions include the Adelaide Hills in South Australia, Coldstream in Victoria and Forth in Tasmania.

Veggycation® explains that Brussels sprouts are not very prone to postharvest decay, but may be affected by the same organisms that infect other brassica vegetables. Bacterial decay can arise from various soft rot causing organisms, but more often from physical injury.

According to Harvest to Home, over a third of Brussels sprouts shoppers know the prices of the vegetable and notice a price change. Almost half of shoppers are only willing to pay what they usually pay for Brussels sprouts.

Veggycation® states that Brussels sprouts are moderately perishable and can be stored 3-5 weeks near 0°C. Shelf life at 5°C is 10-18 days and at 10°C is less than seven days. They are often hydrocooled, but can be air cooled and freeze at about -0.6°C.

In 1998, a project entitled *Resistance of Brussels sprouts to root knot nematodes (Meloidogyne Spp.) And Verticillium Dahliae, September 1998* was completed. The findings of this project are published in the final report, which can be found by searching 'VG97054' on the InfoVeg database.

Veggycation® advises that Brussels sprouts are not to be peeled. It is recommended to trim Brussels sprouts, then remove outer and pick from stem before use. Keep in the vegetable drawer of the fridge.

Growing your business

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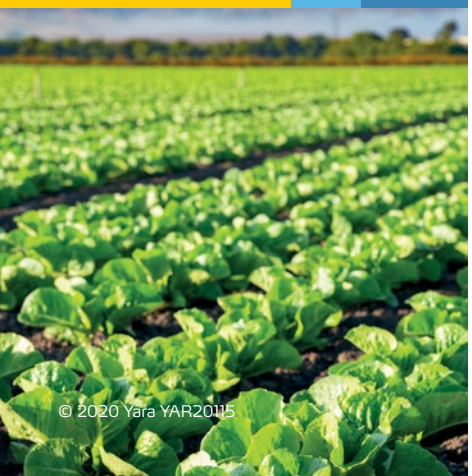
Years



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Fair Farms National Project Manager Marsha Aralar.

Fair Farms Certification accepted by all three major retailers

The Growcom Fair Farms Initiative has received a major boost, with Coles confirming it will join Woolworths and Aldi in accepting Fair Farms Certification as a means for grower compliance. Meanwhile, Fair Farms has announced a new National Project Manager – Marsha Aralar, who joined the team in August.

The Australian horticulture sector continues to back the industry-developed Fair Farms Training and Certification Program, demonstrating industry's commitment to stamping out workplace non-compliance and worker exploitation.

Fair Farms is built on the idea that compliant and ethical employers should be recognised and rewarded for their efforts by their customers and consumers, who may choose to buy Australian produce from ethically verified sources.

In a positive outcome for the program, Coles recently confirmed it would now accept Fair Farms Certification as a way by which fresh produce suppliers can demonstrate compliance with the Coles Ethical Sourcing Policy.

This announcement by Coles means Fair Farms Certification is now accepted by all three major retailers in Australia: Coles, Woolworths, and Aldi.

Coles General Manager Fresh Produce Craig Taylor said the supermarket was proud to give the Fair Farms training and certification program the tick of approval.

"Around 95 per cent of the fresh produce we sell comes from Australian farms, and it's important to Coles and to our customers that the workers in our supply chain are treated fairly," Mr Taylor said.

"By adopting this additional industry-based solution that can be used by all suppliers regardless of who buys their produce, Coles is making it easier for Aussie farmers to meet ethical workplace standards."

New National Program Manager announced

In other news, Fair Farms has announced the appointment of Marsha Aralar as its new National Program Manager.

Ms Aralar brings a wealth of experience to her role as National Program Manager, having worked in a variety of food safety and compliance roles across Australia and the Middle East.

"In my previous role I was lucky enough to get onto farms and get my boots dirty. I really enjoy engaging with growers, getting to understand their business and concerns, and helping them meet market and regulatory requirements," Ms Aralar said.

Eager to strengthen relationships across horticultural and grower communities, Ms Aralar's international qualifications in quality assurance and public health, coupled with an energetic personality, mark an exciting new period for Fair Farms.

"Our goal from here is to build a critical mass of Fair Farms certified businesses. This will enable ethical buyers and sellers to work towards improving the conditions for farm workers, stamping out exploitation," Ms Aralar said.

"It is an exciting time to join the team at Growcom. I am looking forward to further enhancing Fair Farms and driving the continued success of the program and showcasing our world-class growers."

Find out more R&D

Please visit the Fair Farms website at fairfarms.com.au.

Visit fairwork.gov.au and growcom.com.au for more information regarding your obligations as an employer.

Fair Farms is developed and delivered by Growcom with support from the Fair Work Ombudsman, the Federal Department of Agriculture, Water and the Environment and AUSVEG.

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Serenade Prime colonising the root

Harvest Uniformity

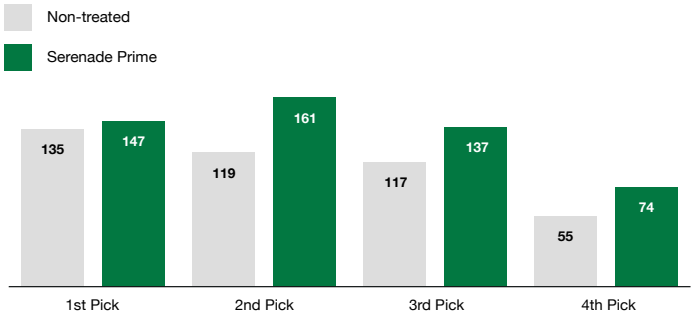
Windolf Farms, Gatton Qld improved yield of Aurora broccoli by over 12%. Greater early vigor (below) and earlier head maturity was observed in the July planting, and better uniformity in the first three picks.

Early Application

Serenade Prime is best applied close to the root zone at planting so it quickly colonises young roots. It needs to be placed no further than 13 cm from roots. Apply 5-7 L/ha through a plant hole drench or as a boom spray over the bed using overhead irrigation to incorporate into the root zone. It can be mixed with common fertilisers and pesticides.

Better broccoli establishment, Toowoomba Qld

Weight (kg) by harvest round* June 2016



*Area treated = 5 x 87 m x 1.5 m beds (0.065 ha)

Find out more at serenadeprime.com.au

Prospect Agriculture agronomist Chris Monsour.

Delivering value during trying times

In this column, Prospect Agriculture agronomist Chris Monsour discusses his involvement in a series of horticultural field trials held in far-north Queensland, which have proved beneficial for growers and advisors before and during the COVID-19 pandemic.

Over the past three years, Syngenta has hosted horticultural field trials under the GrowMore banner to demonstrate crop protection products under commercial conditions. The concept has immense value for advisors and growers. It showcases new chemistry in a commercial program so we can evaluate how the products work and how they might fit into an overall strategy, in many cases well ahead of launch to the market.

I have been involved in two GrowMore demonstrations, and the feedback from the Ayr site in 2019 was excellent. My role was to oversee the establishment of these sites, tailoring a crop protection program based on the insect pests present as well as protectant disease program.

The GrowMore sites are a fantastic concept. We get to see the results in our local growing conditions on a regular basis and it provides an opportunity for growers to come in and see that as well. Often growers don't get to see what would happen if no sprays were applied. It provides an appreciation of how intense the insect and disease activity can be, and how effective the crop protection program has proven to be.

It also means Syngenta sales and technical staff can interact with growers and advisors and hear some of the challenges in their patch. Syngenta is always working on its pipeline of new products; and as a research and development company, any feedback goes a long way.

An online experience

Delivering the Bowen site – from transplant in March to trial-end in June – has proven to be quite different since we were not able to hold the field day due to COVID-19 restrictions.

To Syngenta's credit, we came up with an alternative. This involved me sharing weekly video recordings of how the crops developed with a particular focus on the changing insect pest and disease spectrum, along with the results from the insecticide and fungicide programs. People generally only see the end results from trials. This virtual style of experience brought more people into the crops, much sooner in the piece.

The range of products that we used in the spray program included MINECTO® FORTE, PROCLAIM® OPTI, ORONDIS® FLEXI , and a new development fungicide, as well as first commercial look at the new PLINAZOLIN® insecticide (not yet registered in Australia).

In both the tomato and the rockmelon paddocks, the results were excellent. There was very effective control of insect pests in both the rockmelons and the tomatoes. There was more disease pressure in the rockmelons compared to the tomatoes and the control of gummy stem blight and downy mildew in the rockmelons was very impressive.

Both growers and advisors would be very happy to see these results in their own fields. It was a very impressive overall result.

Find out more R&D

For more information or to ask a question, please contact your local Syngenta Territory Manager, the Syngenta Advice Line on 1800 067 108, visit syngenta.com.au or email *Vegetables Australia*: info@ausveg.com.au. Please note that your questions may be published.

The R&D content for this article has been provided to *Vegetables Australia* to educate Australian vegetable growers about the most relevant and practical information on crop protection technologies and their on-farm applications.

New trial sites: Adelaide Plains, South Australia

Syngenta has announced it will conduct GrowMore horticulture trials in the Adelaide Plains this spring. These trials will demonstrate new solutions to more challenges, with a focus on onion and potato crops. Stay up-to-date by visiting syngenta.com.au/growmore.

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Corteva Agriscience Marketing Manager Nick Koch.

Safeguarding the future of agriculture through sustainable farming practices

Following years of development and testing, a new organic-certified crop protection product has been approved to assist growers in the battle against some of Australia's most destructive pests. This includes fall armyworm, which was detected on our shores for the first time earlier this year.

In the summer of 1982, a research scientist took a well-earned holiday in the sunny Caribbean. While touring the local sights with his wife, he visited an abandoned rum distillery on a tiny tropical island.

Quietly wandering through the old buildings, he was struck by the ghostly, eerie silence. In a climate where the incessant buzz of insect life droned 24 hours a day, the sudden quiet was deafening.

Intrigued, he took some soil samples and transported them back to the United States for testing. What he and his team discovered was a unique soil bacterium that produces active metabolites (spinosyns) that gave excellent control of certain insect pests.

Years of development and exhaustive testing followed, culminating in the release of Entrust® Organic, a product characterised by its efficacy equivalent to synthetic insecticides, but with the safety and environmental profile of a biological.

This product received regulatory approval by the Australian Pesticides and Veterinary Medicines Authority (APVMA) in July 2020, and will be available this October.

New resistance tool

Naturally-derived, highly effective, and fast-acting, this product has long been anticipated by the Australian agricultural market. Its organic certification, favourable environmental profile and selectivity to key beneficial insects make it ideally suited to many Integrated Pest Management (IPM) systems.

Entrust® Organic belongs to a unique insecticide group known as the 'Spinosyns', a group 5 insecticide for resistance management shared only by one other product, Success® Neo.

The introduction of this product offers organic growers a new resistance management tool for the selective control of some of Australia's most damaging pests. As with all insecticides, it is beholden on users to rotate between different chemical Modes of Action (MoA) in accordance with label directions to prevent the onset of resistance.

The broad label covers more than 80 registered crops, including a wide range of fruits and vegetables, making it extremely versatile for farmers with mixed enterprises.

Tackling pest incursions

It offers growers effective control of several damaging *Lepidoptera* species including diamondback moth, heliothis, cluster caterpillar, light brown apple moth and many other caterpillar pests including loopers. It also controls western flower thrips, leafminer and cherry slugs (Diptera).

The recent arrival of fall armyworm (FAW) in northern Australia earlier this year presented significant challenges for organic producers. Subsequently, the APVMA approved an emergency use permit (PER89870) for the use of this product.

"Biological products are often associated with lower levels of performance compared to those of synthetic insecticides," Corteva Agriscience Marketing Manager Nick Koch said.

"Contrary to belief, this could not be further from the truth when assessing the performance of Entrust® Organic."

Trans-laminar activity is a useful feature of this product. The active ingredient moves into the leaf tissue allowing it to control pests, such as leafminer. However, it is not systemic – thorough coverage is required to protect the entire crop and repeated application to protect new growth.

"It's hard to imagine a product that is so effective at controlling pests being environmentally sustainable, but this is certainly the case," Mr Koch said.

"It degrades quickly through exposure to sunlight – breaking down into carbon dioxide and water within a matter of days, which means producers can grow a healthy crop and maintain a healthy farm.

"Organic and conventional producers of fruits and vegetables now have a pest control option that ticks all the boxes. They can be rest assured knowing that their crop protection choices will provide them with a sustainable future for this generation into the next."

Find out more

Entrust® Organic will be available in limited supply from October. To register your interest, please visit entrust-organic.corteva.com.au or call Corteva Agriscience toll free on 1800 700 096 and speak to a Territory Account Manager.

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Meeting the growing demand for organic veg

One of Australia's key wholesale vegetable seedling nurseries has recognised the growing demand for organic produce. Over the past six months, the Boomaroo Nurseries team has worked hard to establish an organic offering for its core crop categories, to be grown at its Victorian and Queensland sites.

Organic fresh produce production in Australia has gone from strength to strength in recent years, spurred by an increased consumer awareness of its impact on the environment, as well as their pursuit of a healthier lifestyle and diet. This has seen an increase in industry revenue of 18.4 per cent over the past five-years.

There has also been a marked increase in growers producing organically or introducing organic lines to their existing product offering to consumers.

To meet the demand for Certified Organic vegetable seedlings, Boomaroo Nurseries is excited to announce that it has now obtained full Organic Certification for commercial seedling production at its Lara and Southbrook sites. This range will be known as Boomaroo Organics.

Here's a little of what will be on offer, and the journey Boomaroo took to get here.

Product range

More than 250 seedling trials have been conducted to date across the Lara and Southbrook facilities, with the final round of Winter trials in Lara currently nearing completion.

With trials achieving strong results, all core crop categories offered as part of the operation's conventionally-grown seedling range will also be offered in its organic seedling range. These include: iceberg lettuce; coloured lettuce; cos lettuce; broccoli; cauliflower; cabbage; celery; silverbeet; tomatoes; leeks; and onions.

Timing

The Southbrook nursery is up and running, and ready to receive orders for organic seedlings now.

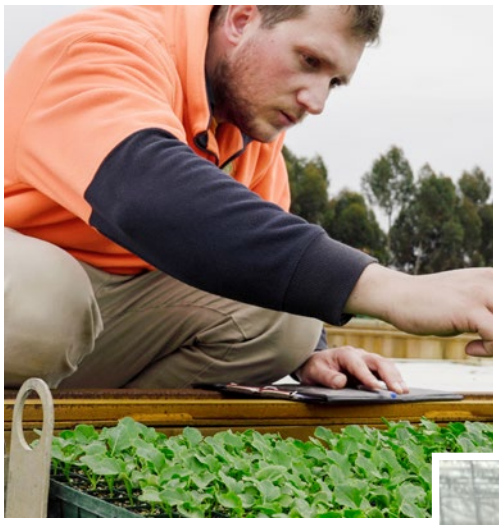
Meanwhile, Boomaroo's Lara nursery is also ready to take Organics orders, with first deliveries on-farm anticipated in late December 2020.

Journey to organic

Boomaroo's journey to Organic Certification has been meticulous and uncompromising, involving all aspects of its operations from its growing and production teams, product sourcing and master planning to quality assurance (QA) and administration to achieve a detailed understanding and full compliance with AS6000:2015, the Australian Standard for Organic and Biodynamic Products. So, what did this journey involve?

Site planning

Comprehensive site assessments and independent audits have been conducted at the Lara and Southbrook sites and Organic Management Plans prepared to ensure segregation between organic from conventionally-grown crops is always maintained, from sowing to seedling dispatch. Additionally, the operation has invested in facility upgrades to further mitigate any cross-contamination risks, including dedicated production equipment, such as watering gantries, and separate storage facilities for organic inputs.



Lara Organic Grower Team Lead, Nik Manchev, inspecting trial progress.

Sourcing of organic inputs

The operation has spent the last 12 months developing partnerships with industry-respected and Certified Organic suppliers of the growing inputs needed to produce strong, healthy and farm-ready organic vegetable seedlings, including growing media, plant nutrition, pest and disease control and seed.

Seedling trials

An extensive program of organic seedling trials is nearing completion, with final winter trials now underway and exceptional results recorded to date. Trials across all crop categories have been conducted in duplicate to assess the performance of a wide range of organic input combinations, and progressively over a 12-month period, to ensure applications are tailored for optimum year-round results.

Compliance

In parallel to the above, stringent organic processes, procedures and protocols have been documented as part of the operation's Quality Management System, providing further validation and confidence to its customers that Organic Certification requirements and their high-quality expectations are met.

Winter Organic bunching onion trials exhibiting promising results.

Find out more

To register your interest or enquire about further crops that may be incorporated into the Boomaroo Organics range, please contact organics@boomaroo.com.

For further information, please visit boomaroo.com/certified-boomaroo-organics/. Alternatively, contact your Boomaroo Territory Manager.

#EatMoreAusVeg: We're all things Aussie veg!

eat more AUSVEG is an initiative of AUSVEG to provide consumers with more practical information about how they can make tasty and healthy meals with a variety of vegetables, and tell the stories behind the farmgate so that shoppers can put a face to the vegetables they buy.

As part of its **eat more AUSVEG** initiative, AUSVEG will be posting practical and valuable information about how to make the most of your vegetables on Instagram via @eatmoreausveg, and will be using the platform to showcase the hardworking growers that grow a wide range of vegetables.

The aim of **eat more AUSVEG** is simple – get more people to eat more vegetables. Some of the barriers for people to eat more vegetables are that they don't know what's in season, don't know how to use them and don't want to waste them by not making them delicious – and we want to try and change this with **eat more AUSVEG**.

AUSVEG will be looking to partner with the broader industry, including growers and the entire supply chain, to provide consumers with information about how to make their vegetables the hero of the plate and to tell the stories of the heroes who grow their vegetables all-year round.

One partnership already underway is with VicHealth CEO and renowned public health expert and advocate Dr Sandro Demaio. AUSVEG has teamed up with Dr Demaio to showcase the easy and delicious dishes that can be made using vegetables, including pumpkin soup, roasted broccoli salad and a vegetable frittata.

Additionally, as part of the **eat more AUSVEG** initiative, AUSVEG will publish quarterly seasonal updates about the vegetables that are in season and provide information on how to make the most of these vegetables throughout the season.

Growers are encouraged to get involved by sending us their best recipe ideas to feature on the eat more AUSVEG platform.

Please email Sophie Burge at sophie.burge@ausveg.com.au to share your recipes, or tag @eatmoreausveg on your Instagram posts showcasing your on-farm production.

Meet our previous Young Grower of the Year award winners

Since 2006, AUSVEG has recognised fresh produce growers and future leaders in horticulture with the Young Grower of the Year Award. Winners of this award have championed the success of the industry and continue to show a commitment to innovation to help inspire the next generation of growers.

In this edition, Michelle De'Lisle speaks to six horticulture industry members who received one of the industry's highest accolades from the National Awards for Excellence, which is held each year at Hort Connections (formerly known as the National Horticulture Convention).

Danny Trandos, Andrew Bulmer, Erika Watson, Daniel Adams, Chris McLoghlin, and Daniel Hoffmann share what has changed since they received their awards as well as what they're doing today, and their plans for the future.

Andrew Bulmer, VIC, 2011

Andrew Bulmer is Managing Director of one of Australia's largest salad producers, Bulmer Farms, located in the East Gippsland township of Lindenow. A year-round growing operation, Bulmer Farms intensively crops over 10 farms totalling over 1,500 acres around and within the Lindenow Valley.

Andrew received the Young Grower of the Year accolade in 2011. By then, he had been working full-time in the vegetable industry for over eight years.

"I believed I had done a lot to understand more about the industry and assist others to have a better understanding and impact. This was while promoting our growing region in Gippsland to gain greater recognition as a significant production region," Andrew says.

Over the past nine years, Andrew has been a strong contributor to the Australian vegetable industry. In addition to his on-farm role, he is a director and Co-Deputy Chair of Food & Fibre Gippsland.

"Like everyone, my role in the industry is what you make it. I don't have more or less of a right to contribute than anyone else," Andrew says.

"I choose to participate in workshops, study tours, the Hort Connections conference and the East Gippsland Vegetable Innovations Days because I want to contribute to the greater good of our industry, share what knowledge I have, and see other leaders emerge within horticulture."

A positive change that Andrew has witnessed over the past decade is industry collaboration.

"I believe the industry has made great strides forward to collaborate. You see this at grower level, with many people willing to share their practices and ideas. At a national level, there is no better example than Hort Connections, which sees great cross-collaboration within the horticulture industry," he says.

Despite his personal achievements – which also include the 2017 ABC Rural and Kondinin Group's Australian Farmer of the Year and 2016 AUSVEG VIC Grower of the Year awards – Andrew's pride is watching his business grow and develop strong long-term relationships within the industry and across the supply chain.

"I have also taken a lot of pride in watching trainees and apprentices that the business has supported come through our system to become managers and great contributors to our business," he adds.

Looking ahead, Andrew remains focused on embracing innovation, collaboration, and sustainability.

"In farming, we are all looking for greater security. We all want to be paid a fair price for what we produce, and be recognised for who we are in society and the role we play as food producers that feed the nation," he says.

"It would be nice to consolidate the business over the next few years and enjoy some family time before the kids grow up too quick. But we should always focus on innovation, sustainability, and collaboration to stay at the top of our game."

Daniel Adams, VIC, 2017

Adams Farms is a family business that has been growing vegetables in Victoria's Yarra Valley for 60 years. During the 1970s, the operation became focused on Brussels sprouts production and today, grows around approximately 1,200 tonnes of sprouts per year.

Firmly entrenched on the farm is Daniel Adams, who received the Young Grower of the Year award in 2017. A third-generation grower, Daniel is Adams Farms Assistant General Manager and works alongside his father, Bruce, and brother Jeremy.

Daniel says winning the young grower accolade was unexpected, but certainly an honour. Attending Hort Connections also proved fruitful.

"Being part of the whole process – getting involved with AUSVEG and Hort Connections – provides great opportunities to network and meet people who may help at some point along the way," he says.

Since 2017, Daniel's responsibilities in the family business have increased as he has continued to build on his knowledge and experience as a vegetable grower.

"One thing I am learning in this industry is you need to be flexible. You need to have good plans, but you have to be prepared to change and compromise a fair bit along the way as different challenges present themselves," he says.

Daniel enjoys where he lives, along with the lifestyle and the challenges it produces.

"One reason my Grandpa started growing Brussels sprouts was because of the challenges; it is always satisfying to put in the work and see the results. There are also a lot of great people you get to meet through various means," Daniel says.

At the time of writing, demand for Brussels sprouts was strong. Daniel, Bruce and Jeremy had recently broken a personal record for units packed in a week – two weeks in a row.

"We are pretty happy with how things operate. The potential to expand is there, but at the moment we have quite a good lifestyle balance, so we'll keep plodding along and doing what we do," Daniel says.

Daniel Hoffmann, SA, 2019

The world has changed dramatically in the 12 months since Daniel Hoffmann received the Corteva Young Grower of the Year award at Hort Connections.

It had been a busy 12 months for Daniel prior to the COVID-19 pandemic. Last year, Daniel was recognised for his ongoing advocacy work on behalf of growers needing access to agricultural water in the Penfield Gardens region north of Adelaide. This was ultimately successful.

"I couldn't believe it when I drove down the road and saw the pipes getting set up. The recycled water is nearly there, which is great," Daniel says.

Winning the 2019 Corteva Young Grower of the Year award has given Daniel a voice in the South Australian vegetable industry.

"AUSVEG SA and its CEO Jordan Brooke-Barnett has helped so much with the recycled water situation for the small group of farms that are trying their best. We are all really grateful for that support," Daniel says.

Once the recycled water plan was finalised, Daniel took a break before entering an agronomy role at Growers Supplies. He is relishing working in this new position and learning about different crops.

"I work with farms right across Virginia, the Adelaide Plains and into the Adelaide Hills. I absolutely love this work," Daniel says.

"I've always loved growing things. While the business side of things didn't agree so much at the time, I now get to be involved in so many different crops and trials as well as helping growers where I can. It's awesome."

Although Daniel's career has branched out, his own farm remains viable – albeit in a smaller capacity.

"Our farm still grows plenty of vegetables for us and the community at the farmers' markets. We keep things pretty simple now; growing what we need to, when we want to," he says.

"I've always enjoyed growing my produce, but now I get to be involved in all sorts of different produce that is being grown. I'm exactly where I need to be."

Chris McLoghlin with Fable co-founders Jim Fuller and Michael Fox.

Chris McLoghlin, VIC, 2018

Chris McLoghlin's career in horticulture has shifted since winning the 2018 Corteva Young Grower of the Year award at Hort Connections.

No longer directly involved in primary production, which Chris admits he misses already, last year he co-founded a value adding branded food business called Fable that takes mushroom products and turns them into meat alternatives.

"I'm the Chief Product Officer, working on matching consumer tastes with our supply chain capabilities," Chris explains.

"We launched at Heston Blumenthal's restaurants, and the product has recently hit shelves in supermarkets nationally."

Additionally, Chris is on the board of the technology company Escavox, which he co-founded in 2018. Escavox provides supply chain monitoring and intelligence services for vendors of perishable goods into the major supermarkets and several export channels.

In 2018, Chris took home the Corteva Young Grower of the Year Award and it had a positive immediate impact his business at the time, Mycelia Organics.

"I was contacted by some new customers. Secondary to that, the award raised the profile of the business and meant it was possible to share our story more widely," he says.

"Winning the award was fantastic recognition of the team's hard work, as well as stretching the historical functions of the business into new areas and markets."

While Chris isn't currently involved in growing produce, that will soon change.

"There's a satisfaction that comes from growing produce that you can't quite get from involvement in other parts of the supply chain," he says.

"So, we have some trials taking place and plans to be growing some very cool products soon! I've been learning significantly about downstream value-adding and distribution. Many of the same lessons from fresh produce apply to the marketing and distribution side of the business, but manufacturing is very different to farming – there is plenty to learn there."

Chris' mission is still the same as it was a couple of years ago: Bring the benefits of fungi to the world.

"Right now, it's through the use of mushrooms as meat alternatives and medicines," he says.

"There's huge scope within that. Extending beyond that, building a strong connection and consumers loyal to our brand and mission will allow us to pursue a number of fungi-inspired regenerative food and medicinal production systems."

Danny Trandos, WA, 2007 & 2013

Danny Trandos is the only dual Young Grower of the Year award winner. Based 40 kilometres north-west of Perth in Neerabup, Danny is General Manager at Trandos Hydroponic Growers (THG). This is a position that he has held for 22 years – and it has evolved over that time.

When Danny won the 2007 Young Grower of the Year award, THG was a vastly different business.

"In 2007, our business was mainly focused on the production of hydroponic produce such as truss, cherry and cocktail tomatoes," he says.

"Over the past two decades, our focus has shifted from production to propagation services. At THG, we specialise in grafting of various vegetables and reproduction of fruiting plants through cuttings and tissue culture.

"I am involved in researching new genetics and propagation solutions for the agriculture industry in different areas."

Since winning his first award, Danny has witnessed the vegetable industry's continual innovation and embrace of technology.

"Technology and computing power have improved, and agriculture is benefiting from it greatly," he says.

Although Danny was proud to win the 2007 and 2013 Young Grower of the Year awards, his focus is on the present and what lies ahead.

"Awards and accolades are nice, but my relationship with growers and industry peers is most rewarding," Danny says.

"The awards gave me some recognition and some 'airtime' but once the show is over, you need to continue to evolve, develop your passion and keep moving forward."

Danny's proudest achievement is assisting growers in reaching their crop potential. It is also what motivates him.

"All of us in the supply chain – from the seed producer to the customer – should all have the chance to benefit in terms of health, happiness and, most importantly, be able to operate sustainable businesses in the process," Danny says.

This is a mantra Danny is developing in his own business.

"I think whichever direction we choose to take, we must remain mindful, transparent, take criticism, love our work and have humility," he concludes.

Erika Watson, NSW, 2015

Erika Watson and her partner Hayden Druce started Epicurean Harvest in October 2013 in the New South Wales Blue Mountains region. It was humble beginnings, with the couple establishing a business in their own backyard. Erika and Hayden then went on to lease an acre nearby where they worked as full-time market gardeners.

In 2015, Erika received the Young Grower of the Year award at the National Horticulture Convention for her business innovation.

"It was an honour to be recognised as a new business for cropping vegetables in an organic poly-culture, no tilling of permanent beds, in situ composting, growing unusual plants, celebrating the value in the entire crop (edible leaves, flowers and fruit of a plant) and selling direct to high-end customers and community," Erika says.

Fast forward to 2020, and the couple own a 50-hectare property in Hartley, which is located on the NSW Central Tablelands. Epicurean Harvest holistically grazes a small herd of cattle and grows organic produce for direct sale to restaurant and local market through a community supported agriculture (CSA) scheme. Erika's role is widely varied on- and off-farm: she manages the business' accounts to crop plans and rotations; community events and workshops; post-harvest management; and more.

Over the past five years, Erika has gained a deeper insight into the vegetable industry.

"I have learnt about drought, water and land management, business risk management, diversification, adaptation and pivoting to remain operational," she says.

Erika has also recognised the need to maintain a work-life balance.

"There is always a job to do on-farm, but sometimes you need to play to survive."

Erika enjoys growing a wide variety of fresh, top-quality organic vegetables, and she reaps the on-farm rewards.

"One of my proudest achievements is managing challenging soils – those with low fertility and poor drainage – and turning them into well-functioning ecosystems that produce amazing tasting organic vegetables," she says.

"I also love the idea of making the vegetable area I grow in accountable to the land resources I use. This is always difficult, but highly rewarding."

Looking ahead, Erika is hoping to maintain that sense of community within her business.

"We'd like to continue a CSA model for local community, which we have only recently trialled, and maintain our relationships with the restaurants/chefs we work with," she says.

Challenging year sees vegetable exports dip 6.6 per cent

Australia's export of fresh vegetables saw a drop of 6.6 per cent for the first half of 2020, with the industry achieving export value of $130 million and 126,000 tonnes during a challenging period for exporters. With market closures, the food service sector grinding to a halt, supply chain disruptions and freight services being heavily impacted by COVID-19, vegetable exporters' perseverance was rewarded with international trade figures up 12.9 per cent in the month of June 2020. AUSVEG International Trade Specialist Andrea Lin reports.

Following a difficult start to the year with tough environmental conditions – bushfires and drought – exporters have managed to keep international trade going through the COVID-19 pandemic. While some vegetable export crops have faced challenges during the first half of the year, the vegetable export supply chain is resilient, with over 126,000 tonnes of fresh vegetables shipped to international markets during the COVID-19 pandemic.

Exporters continue to deal with challenges in freight and logistics, particularly with securing air freight, which was reduced by as much as 90 per cent earlier in 2020. However, with support from the Federal Government's International Freight Assistance Mechanism, there is more capacity in the air freight network to support exporters.

At the time of writing, there were approximately 1,400 international flights out of Australia carrying freight per month, down from 9,000 in pre-COVID times.

The Australian Dollar (AUD) appreciated to over US$0.72 for the first time in 15 months in August. Continued strengthening of the AUD may impact competitiveness of Australia's fresh vegetable exports in international markets.

Table 1: Change in vegetable exports January to June 2019-2020

Months	2019		2020		▲ 19/20	
	$AUD	Tonnes	$AUD	Tonnes	$AUD	Tonnes
January	17,234,909	16,615	13,844,442	11,697	▼ -19.7%	▼ -29.6%
February	20,346,465	20,517	21,183,021	20,493	▲ 4.1%	▼ -0.1%
March	27,636,395	29,104	23,695,578	25,213	▼ -14.3%	▼ -13.4%
April	27,876,485	36,112	25,732,245	26,743	▼ -7.7%	▼ -25.9%
May	24,180,596	22,312	20,827,359	20,512	▼ -13.9%	▼ -8.1%
June	21,870,220	19,970	24,700,958	21,652	▲ 12.9%	▲ 8.4%
Total	139,145,070	144,630	129,983,603	126,310	▼ -6.6%	▼ -12.7%

Exports from January to June 2020

In the first half of 2020, total vegetable exports declined slightly compared to the same period in 2019. Based on data from the Global Trade Atlas, there was a slight dip of 6.6 per cent in vegetable export value, from $139.1 million to $129.9 million.

Total vegetable export volume declined by 12.7 per cent from 144,630 tonnes to 126,310 tonnes over the same period. The month of June 2020 saw an upturn in vegetable trade, with export value increasing by 12.9 per cent to $24.7 million and volume increasing 8.4 per cent to 21,652 tonnes (refer to Table 1).

Table 2: Change in vegetable exports by destination market January to June 2019-2020

Trade Partner	2019		2020		▲ 19/20	
	$AUD	Tonnes	$AUD	Tonnes	$AUD	Tonnes
Singapore	22,558,483	13,743	24,753,755	14,139	▲ 9.7%	▲ 2.9%
United Arab Emirates	16,726,766	25,248	17,668,781	18,917	▲ 5.6%	▼ -25.1%
Malaysia	14,087,171	14,028	14,427,888	13,233	▲ 2.4%	▼ -5.7%
Hong Kong	9,289,295	5,252	9,002,463	5,049	▼ -3.1%	▼ -3.9%
South Korea	10,405,523	17,037	7,913,251	13,099	▼ -24.0%	▼ -23.1%
Saudi Arabia	8,496,639	9,330	7,595,461	8,558	▼ -10.6%	▼ -8.3%
Thailand	8,244,871	9,798	6,982,558	7,455	▼ -15.3%	▼ -23.9%
Qatar	6,055,595	6,435	6,212,918	6,061	▲ 2.6%	▼ -5.8%
Philippines	3,192,395	4,923	4,346,515	7,178	▲ 36.2%	▲ 45.8%
Indonesia	2,634,526	2,256	3,911,380	5,495	▲ 48.5%	▲ 143.6%

Exports by destination market

Singapore remained the top export destination for Australian vegetable exports, with an increase in value in the first half of 2020 by 9.7 per cent (from $22.5 million to $24.7 million); export volume was up by 2.9 per cent from 13,743 tonnes to 14,139 tonnes.

The United Arab Emirates (UAE) rose 5.6 per cent in value but experienced a decline of 25 per cent in volume. Malaysia saw a similar trend, with a rise in export value of 2.4 per cent and a decline of 5.7 per cent in volume. South Korea experienced the largest decline in trade of the top export markets, with an average drop of 24 per cent in both value and volume (refer to Table 2).

Table 3: Vegetable exports by crop January to June 2019-2020.

Trade Partner	2019		2020		▲ 19/20	
	$AUD	Tonnes	$AUD	Tonnes	$AUD	Tonnes
Carrots	47,307,383	53,477	45,883,484	50,905	▼ -3.0%	▼ -4.8%
Potatoes	23,875,436	39,248	27,196,115	34,950	▲ 13.9%	▼ -11.0%
Onions	34,938,301	41,233	26,143,109	31,717	▼ -25.2%	▼ -23.1%
Brassicas	9,541,853	2,960	9,265,198	2,214	▼ -2.9%	▼ -25.2%
Lettuce	6,134,555	909	4,607,694	675	▼ -24.9%	▼ -25.7%
Celery	4,985,482	2,825	4,320,040	2,494	▼ -13.3%	▼ -11.7%
Pumpkins	2,528,451	1,456	3,322,804	1,633	▲ 31.4%	▲ 12.2%

Exports by state

While the performance of Australian vegetable exports has been more consistent and better than expected due to COVID-19 disruptions, exporters from different Australian states have fared differently during 2020. Western Australia remained the strongest fresh vegetable export state, with a dip of 4.4 per cent in value and around 4,000 tonnes compared to 2019. Victoria had a significant drop in export volume of 2,543 tonnes or 41 per cent, seeing exports fall from 6,254 tonnes to 3,711 tonnes. South Australia and New South Wales both saw increases in export value and a decrease in export volume, on the back of potato exports (refer to Table 4).

Table 4: Vegetable exports by state January to June 2019-2020.

Trade Partner	2019		2020		▲ 19/20	
	$AUD	Tonnes	$AUD	Tonnes	$AUD	Tonnes
Western Australia	54,987,555	60,259	52,541,657	56,077	▼ -4.4%	▼ -6.9%
South Australia	20,993,913	32,770	23,771,617	28,725	▲ 13.2%	▼ -12.3%
Tasmania	23,982,530	28,047	17,947,527	23,746	▼ -25.2%	▼ -15.3%
Victoria	17,476,836	6,254	14,555,372	3,711	▼ -16.7%	▼ -40.7%
New South Wales	11,926,448	13,938	13,189,405	11,369	▲ 10.6%	▼ -18.4%
Queensland	9,597,341	3,352	7,805,771	2,648	▼ -18.7%	▼ -21.0%

Exports by crop

For the first half of 2020, root vegetables such as carrots, potatoes and onions continued to ship significant export volumes. Notably, potato export value has increased from $23.8 million to $27.2 million, nearly 14 per cent up on 2019.

Pumpkin is the only vegetable that has recorded an increase in both export value and volume. Pumpkin exports grew by 31.4 per cent, from $2.5 million to $3.3 million and an extra 170 tonnes in volume from 1,456 tonnes in 2019 to 1,633 tonnes in 2020 (refer to Table 3).

The figures in Table 3 outline the total exports for the January to June 2020 period, but do not highlight monthly fluctuations for different crops exports. Over the course of these six months, perishable air freighted products saw a drop in exports on a month to month basis, albeit with some exceptions for certain crops into specific markets. Generally, sea freighted hard vegetable products performed better than the perishable vegetable exports; however, carrots, potatoes and onions also experienced fluctuating trade from month to month.

Find out more R&D

Any growers interested in any export events or discussing export opportunities can contact the AUSVEG Export Development team on 03 9882 0277 or export@ausveg.com.au.

The *Vegetable industry export program* has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

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Hort Innovation Strategic levy investment | VEGETABLE FUND

Photography by Andrew Beveridge.

From nurse to 'farm girl': Monika's pathway to success

Monika Fiebig is an example of how overhauling a career path can lead to great success. Over two decades ago, Monika quit her job as a nurse to start up Monika's Organics, an organic vegetable growing operation in Adelaide's north-east that she runs with her son Daniel. Michelle De'Lisle speaks to Monika about her journey and the challenges faced along the way.

South Australian organic vegetable grower Monika Fiebig knows what it is like to rebuild her career. During the late 1990s, Monika – in her own words – "fell on hard times financially", which she says had a huge impact on her personal well-being and relationships.

"I made the decision to be single and independent, and started my business from scratch 21 years ago," Monika says.

"I did this with my eldest son Daniel who, at nine years of age, was very keen to be my business partner. I was a nurse for 20 years, not a farmer. I knew a few growers in the vegetable industry who soon became my mentors, guiding me through basic agronomy and even buying my produce."

During 2001, Monika met an organic grower and soon realised her next career move.

"Getting involved in as many vegetable industry workshops and events began to fill my huge knowledge gaps," Monika says.

"A number of industry people offered their guidance and expertise. I researched my markets, my capabilities, assessed my risks and left no stone unturned as failing was not an option.

"There was no turning back."

And there certainly wasn't. After a 21-year journey, Monika's Organics is now a vertically integrated business model and a leading supplier to Coles, Woolworths, Foodland and IGA, as well as independent fruit and vegetable stores in South Australia. Monika's Organics also supplies interstate, with certified organic produce grown either on-farm or brought in from other producers across Australia.

Based at Golden Grove in Adelaide's north-east, Monika's Organics currently produces certified organic bunch spinach, silverbeet, kale, spring onions and leeks.

Building a business

Monika isn't afraid of old-fashioned hard work, and in the early days she got her hands dirty.

"I was driving the truck and tractors, working the land, planting, harvesting, marketing, maintaining compliance, banking, doing repairs and setting up irrigation," Monika says.

"I was also looking after the children: doing the school run, washing, cooking and cleaning, which were never-ending jobs.

"I felt like Superwoman. But I then had to do it all again the next day, and didn't see an end to the gruelling cycle that I became immersed in."

Today Monika oversees the business operation; from staff training to quality assurance, administration, reports as well as maintaining all areas of compliance and accredited programs.

Tackling on-farm issues

While business has steadily grown over the past two decades, there are still on-farm challenges that Monika and her team face, including weeds and managing their impact.

"Although we have an interrow mechanical weeder, and a couple of other mechanical gadgets that help considerably, we still have to hand weed," Monika says.

"We try to get on top of the weeds early."

Backpackers are relied upon to hand weed during the season's peak, and Monika engages staff in social media videos to make the hand weeding process entertaining.

To maintain on-farm disease resistance, Monika says she follows the basic principles of farming, which are no different for organic growers.

"For example, we undertake crop rotations, fallow land and use green manure crops. Having a good understanding of our soils and feeding the soils with the life force it needs is good for nutritional balance and microbiome," Monika explains.

Meanwhile, maintaining consistent supply to customers and fulfilling their needs can also be a challenge.

"We are always on the look out to partner with highly-skilled reliable organic

growers to meet customer demand," Monika says.

"Consistent supply from growers equates to strong partnerships."

An international perspective

In October 2019, Monika attended the AUSVEG-led U.S.A. Industry Leadership and Development Mission. The study tour, a strategic levy investment under the Hort Innovation Vegetable Fund, provided many highlights for Monika that included seeing the large-scale production areas and visiting farms in in the desert regions of Arizona. She also gained an insight into the Colorado River system and how it is controlled.

"The Colorado River system runs through California to Arizona and finally to Mexico. The water quality is excellent at all states and quantity is fully-controlled – everyone gets what they require, including the environment," Monika says.

"Growers developed waste drainage systems on their farms, as well as designated areas for excessive waste, so they were able to not contaminate the river with chemical run off and nitrates. I saw this river over 10 years ago and it was in real trouble. In that time, the river hasn't been traded or bought and sold to foreigners purely for investment."

Monika says the study tour confirmed that she is on the right track with organic growing, with the sector growing in the U.S.A. year-on-year.

"There is growing interest in food sovereignty and food as medicine, which is seen all over the world," she adds.

Monika highly recommends attending an overseas study tour.

"I have been on a few over the past 12 years and have learnt so much," she says.

"For example, I have seen sophisticated machinery and research stations that belong to growers. I have looked at a business model between growers, agents, and customers, and have attended several of the world's largest horticulture events. At those, I have seen innovative products and trends before they have reached Australia."

Organic pride

Monika's hard work hasn't gone unnoticed. In 2017, she was nominated for the Women in Horticulture award at Hort Connections – a proud moment, and one that made Monika feel like she was "on the right track" in her career.

"It inspired me to keep going. I may be a small grower in real size and capacity, but huge in terms of service delivery and brand recognition for South Australia," she says.

Monika's enthusiasm for organic vegetable growing hasn't wavered over the past two decades.

"I enjoy knowing I am part of organic farming principles that encompasses a holistic approach to caring for soils, water, animals, people and the environment, including integrated pest management and vegetation restoration," she says.

"I love connecting to people within the supply chain and growers and listening to their stories. Taking on a new career path from nurse to 'farm girl', specialising in organic farming, satisfies my passion for health and the environment. It sits very well with who I am and what I stand for."

Monika also pays tribute to her son, Daniel Quattrocchi.

"I could not have achieved this without the support of Daniel. He has been my business partner since the age of nine and a half," she says.

"Twenty-one years later, Daniel has the same passion, enthusiasm, values and standards as me. I have great confidence in his ability to drive our business forward and be able to withstand whatever is thrown at us.

"As a single mum bringing up two small children, I have had a huge journey. We have faced many challenges to get to where we are today."

Focus on nitrogen stabilisers in the soil

Horticulture crops need nitrogen (N) to consistently produce high yielding and exceptional quality crops. The challenge is to select a nitrogen fertiliser product that will reduce risk, improve nutrient use efficiency, optimise production, and benefit quality. Incitec Pivot Fertilisers Technical Agronomists Conrad Leeks and Rob Dwyer report.

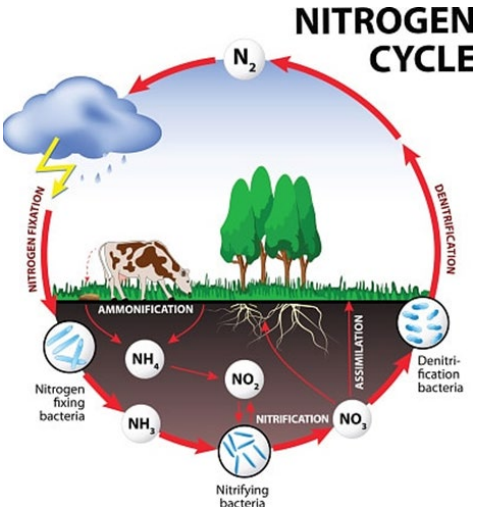


Figure 1: The nitrogen cycle.

Fertiliser product choice starts with understanding the N cycle and potential losses (see Figure 1). N in fertiliser, crop residues, manure or compost, is transformed by soil microorganisms either into an organic form (soil organic matter) or a plant-available form (nitrate).

Over time, any N immobilised into organic matter can become plant-available later. This is only a temporary loss. Two other losses – denitrification and leaching – are more costly.

Nitrate is a plant-available form of N, but it is also the form most at-risk of loss by leaching and denitrification.

Nitrate leaches due to its negative charge. Nitrate, soil colloids and soil organic matter all possess a negative charge, and two negatives cannot attract. There is a fine balance at play here. We need rainfall or regular irrigation to keep the crops productive. However, every time water moves through lighter soils, NO_3^- moves with it. If nitrate moves beyond the root zone, crops can not access it to grow.

Denitrification occurs in waterlogged soils. The microbes use the oxygen in NO_3^- as an oxygen supply – producing nitrous oxide along the way. The problem is worse where soils are: compacted or poorly structured; have soil organic matter levels (and therefore high soil microbe populations); or over irrigated.

Addressing the issue

To combat the nitrogen challenge, Incitec Pivot Fertilisers has developed ENTEC. This ammonium stabiliser slows the conversion rate of ammonium to nitrate. It works by inhibiting the *Nitrosomonas* group of soil bacteria, which keeps N in the top soil in the ammonium form (NH_4^+) for longer. As ammonium it has a positive charge, it will not readily leach through the profile and has *zero* denitrification loss potential. Crops can still take up N when it is in the ammonium form.

This product also reduces nitrous oxide emissions. In Victorian trials, ENTEC Nitrophoska was shown to reduce the average nitrous oxide N_2O emission flux by 69 to 100 per cent compared to traditional fertilisers.

This means it keeps more nitrogen where its most wanted – in the soil and available to the crop.

In a horticulture situation, seedlings or transplants do not use a lot of N during early establishment. Using this product with the base fertiliser helps to reduce these N losses by keeping the N in the more stable and still plant-available ammonium form. As the crop becomes established, there is N available in the root zone for crop uptake.

ENTEC has been shown to be effective in the soil from 4 to 10 weeks. This has been demonstrated in laboratory results in a moist alkaline vertosol soil at 25°C, where 97 per cent of applied fertiliser had converted to nitrate after 14 days without product protection. When it was used, over 70 per cent of the nitrogen was stabilised as ammonium after 50 days.

This is very important for crops grown under irrigation. For example, this blend improved yield for an irrigated broccoli crop where there was crop residue, wet conditions (due to overhead irrigation), compacted soil and warm temperatures.

Using NH_4^+ stabilisers ensures flexibility regarding timing of application. Fertiliser can be applied early in crop development, without compromising yield N loss potentials. Potentially fewer fertiliser applications are required when using an NH_4^+ stabiliser, with more N being protected and 'banked' in the topsoil. Research has demonstrated that one fertiliser application could be dropped in Victoria due to enhanced N use efficiency.

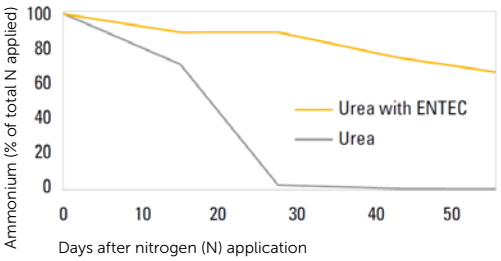


Figure 2: ENTEC stabilises nitrogen as ammonium for longer than conventional 'untreated' fertiliser.

Find out more

Please contact Conrad Leeks at conrad.leeks@incitecpivot.com.au or 0466 664 026 or Rob Dwyer at rob.dwyer@incitecpivot.com.au or 0428 111 471.

To read an extended version of this article, including a table of statistically significant horticulture crop responses to ENTEC in Australia, please visit incitecpivotfertilisers.com.au/news-and-insights/agronomic-insights/horticulture/entec-in-horticulture---nitrogen-stabilisers-in-the-soil.

Pathogen persistence on leafy vegetables

Now, perhaps more than ever, people are concerned about their health. Higher vegetable intake is advised, but what happens if veggies make consumers sick? A project has been investigating pre-harvest water and untreated animal manure withholding periods to minimise or eliminate the risk of microbial contamination of high-risk vegetable crops. Project team member Dr Jenny Ekman from Applied Horticultural Research reports.

One of the best ways to stay healthy is to eat plenty of vegetables – a message the industry has been strongly communicating. Vegetables are 'hero' foods: here to save us.

However, heroes can soon become villains if things go wrong. Bacteria that cause human illness, such as *E. coli* and *Salmonella*, can be present in soil, carried in irrigation water and – very, *very* occasionally – found on vegetables. Even small numbers of these bacteria on products that are eaten raw, such as leafy salad greens, can make people sick.

Washing vegetables with sanitisers can reduce risk. However, even a triple wash with chlorine cannot remove 100 per cent of bacteria once they are on (and in) fresh vegetables.

Keeping produce clean

The best way to reduce the risk of microbial contamination is to keep animals and manure away from irrigation water and cropping areas. Risk can also be reduced by only applying soil amendments that have been properly composted and using irrigation methods (e.g. sub-surface drip) that avoid contact with the harvestable part.

Food safety risks from contaminated water depend on the irrigation method used. However, this is not always possible. Poor or untested water may be the only water available, with overhead systems the only practical way to irrigate many crops. Moreover, manures have many benefits for soil; they can sustainably add organic matter and nutrients, improve structure, and stimulate microbial activity.

Withholding periods

Bacteria that evolved to live inside the human gut are relatively poorly adapted to the exposed, dry conditions on plant surfaces. Withholding periods allow populations of human pathogenic bacteria in soil and water to die off, returning to normal environmental levels.

For example, Freshcare stipulates a withholding period of 48 hours between application of water that may contain >100 *E. coli* bacteria (CFU)/ml and harvest. Untreated manures must be incorporated at least 90 days before harvest if products are grown in or close to the soil and may be eaten raw (e.g. carrots, leafy greens) with a 45-day exclusion period for lower risk products (e.g. potatoes). It should be noted that other standards mandate much longer exclusion periods of up to 365 days, or simply prohibit the use of manures.

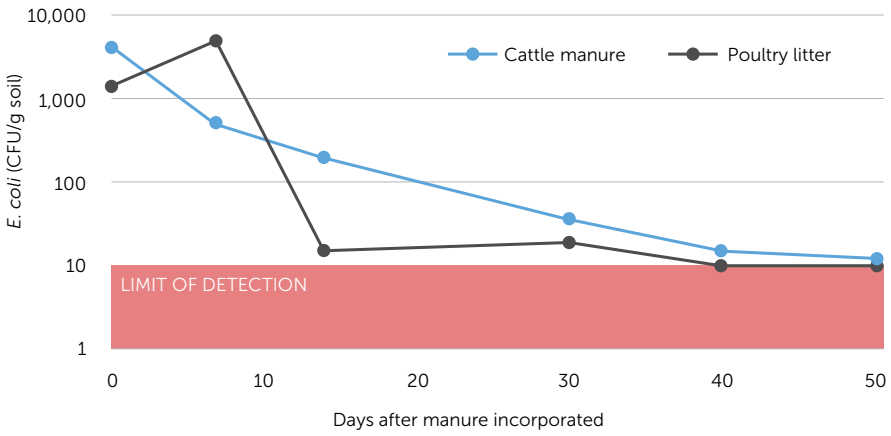
A recently-completed project examined whether these withholding times are appropriate for Australian vegetable crops. *Pathogen persistence from paddock to plate* (VG16042) is a strategic levy investment under the Hort Innovation Vegetable Fund.

Growing lettuces in manure-amended soil

Cattle manure and poultry litter were incorporated into plots containing clay loam or sandy soil at a high rate (20t/ha) at the start of spring (A), summer (B) and autumn (C) crops of cos lettuce.
As the manures did not contain detectable human pathogens, *E. coli* was added to achieve approximately 100,000 individual bacteria (CFU) per gram of manure. *Salmonella spp.* was also added to the poultry litter, achieving approximately 2,500 CFU/g manure. →

Vegetables were grown in the field or glasshouse, lightly damaged (or not) and irrigated with contaminated water.

Estimated *E. coli* populations in soil amended with 20t/ha poultry litter or cattle manure. Mean values calculated from three trials (n=12).



Additional plots were amended with manure alone (no added pathogens) or left as untreated controls (no manure). Soil samples were taken for testing at intervals during crop production, and mature lettuce were tested from crops B and C.

Where did all the bacteria go?

Populations of *E. coli* in soil and poultry litter fell from up to 20,000 CFU/g soil to below the level of detection (10 CFU/g) within 50 days in all three trials. This indicates a mortality of over 99.9 per cent. A similar result occurred for soil and cattle manure in trials A and B, with *E. coli* declining below the level of detection within only three weeks. However, the bacteria survived longer in the relatively mild conditions of trial C (autumn). Despite this, after 50 days, the average population was <13 CFU/g soil, suggesting at least 98 per cent had died.

Salmonella populations also declined rapidly after addition to soil. In trials B and C, the bacteria could not be detected in samples taken two weeks or more after the poultry litter was incorporated. However, *Salmonella* survived significantly longer during trial A (spring). Even though the population was low (<3 bacteria/gram), there was still a 50-50 chance of detecting *Salmonella spp*. in soil after 50 days.

To simulate a worst-case scenario, mature lettuce was tested for human pathogens with the dirty outer leaves still attached. Of 200 lettuces tested, two (one each from poultry litter and cattle manure) had unacceptable levels (>100 CFU/g) of E. coli. However, by far the highest level of *E. coli* recorded, at 40,000 CFU/g, was on a lettuce from an unamended control plot. None of the lettuces tested were positive for *Salmonella*.

Contaminated irrigation water – the difference damage makes

These trials examined how long *E. coli* and *Salmonella* bacteria survive on the surfaces of leafy vegetables. Plants were irrigated with water containing moderately high populations of these bacteria. Both species fell below or close to detectable levels within 48 hours. Results were similar for a range of vegetables (cos lettuce, parsley, silverbeet, kale, spinach), regardless of whether they were grown in a glasshouse or the open field.

However, die off rates were very different if the plants were damaged. In this case, bacteria survived for at least 6 days after irrigation.

Even minor injury – such as cracked leaves, light frost damage or infection by disease – can increase the risk of bacteria surviving on vegetables. We found similar results even when there was heavy rain, or temperatures over 40oC. Cos lettuce appeared particularly susceptible, possibly because they are so easily damaged.

The next question was – if damage has occurred, how long does it take the plant to heal, regaining its usual resistance to contamination? In our trials, baby spinach damaged 24 hours or more before irrigation was no more likely to be contaminated than undamaged plants. However, cos lettuce, plants damaged up to four days before irrigation with contaminated water still had high populations of *E. coli* after the 48-hour withholding period.

Key findings

The quality of water that contacts the plant is the most important factor affecting the food safety of leafy vegetables. Many of the significant food safety outbreaks associated with salad greens can be traced back to contaminated water. In contrast, contamination by human pathogenic bacteria surviving in the soil is less likely, especially if manures are incorporated at least 50 days before harvest.

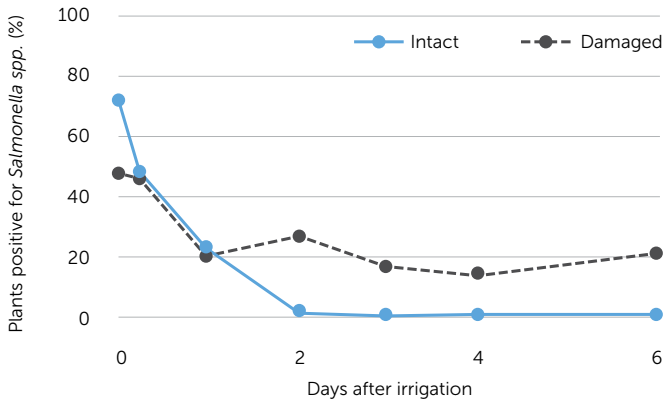
The required 48-hour withholding period between application of water in irrigation or crop sprays significantly reduces survival of human pathogens on leaf surfaces. However, these bacteria will persist much longer if crops are damaged. This injury can be relatively minor, certainly below commercial thresholds.

Once internalised, human pathogens cannot be easily removed. Even washing with sanitisers cannot ensure vegetables are safe to eat if they have been contaminated before harvest.

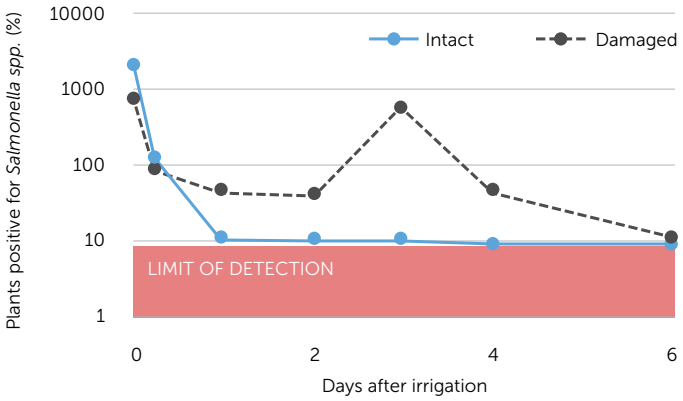
If vegetables have been damaged, avoiding contact with poor quality water (>100 CFU/ml *E. coli*) for >24 hours, and increasing the withholding period between application and harvest, may reduce risk. However, in our trials, cos lettuce was very susceptible to contamination. It is recommended to avoid contact between cos lettuces and contaminated water at all times.

Detections of *Salmonella* and populations of *E. coli* on damaged and intact vegetables following irrigation with contaminated water. Mean values from five trials conducted in the glasshouse and in-field with a range of different crops.

Detections of *Salmonella* spp.



Populations of *E. coli.*



Further information

Guidelines on reducing risk from manure and safe use of irrigation water, as well as fact sheets on this project, are available from the Fresh Produce Food Safety Centre website (fpsc-anz.com), Hort Innovation (horticulture.com.au), Applied Horticultural Research (ahr.com.au) and Freshcare (freshcare.com.au/resources).

Find out more R&D

Please contact Dr Jenny Ekman at jenny.ekman@ahr.com.au.

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

Project Number: VG16042

Hort Innovation Strategic levy investment | VEGETABLE FUND

Fresh thinking for fruit and produce packaging

With fresh food and meal kit delivery services on the rise, there is growing demand for sustainable packaging solutions that ensure freshness and convenience for consumers. *Vegetables Australia* investigates the options that are available to food producers and businesses.

Consumers, retailers and growers are all looking for sustainable packaging solutions that produce less waste and offer a more environmentally-friendly option, without compromising pack quality.

In response, Visy has designed the Enviropunnet™ – a recyclable option that enables confident delivery of product to consumers, while building brand loyalty.

The Enviropunnet™ is made from FSC® (FSC C008345) certified fibre that is environmentally responsible, socially beneficial, and economically viable. The pack is easily dismantled and takes up minimal bin space, making it easy for consumers to recycle.

Extensive trials and analysis has been conducted on this packaging, ensuring quality performance for a variety of fruit and produce products.

With recent concerns over hygiene and food safety, many consumers are opting for pre-packed fruit and vegetable formats that minimise exposure to environmental elements and human touch. This solution can be partnered with Visy Connect tags to help reduce product tampering, providing consumers with additional confidence.

The pre-packed format offers retailers the added benefit of reduced spoilage, while consumers appreciate the increased convenience of 'grab-and-go' shopping experiences.

It also offers maximised branding opportunities, allowing increased engagement with consumers around product brand, sustainability story and product origin.

Available in a variety of shapes and formats to cover all fruit and produce needs, the Enviropunnet™ is flexible, adaptable and equally suitable for in-store experiences or online offerings. This is important because beyond the move for increased sustainable packaging in the retail environment, the industry is also seeing a greater proportion of produce purchased online. E-commerce is a quickly growing market and is forecast to be worth A$32.5 billion in Australia by 2024*.

Delivery focus

In addition, Visy offers an e-commerce Thermal Home Delivery range for premium product protection, optimal quality, and freshness. The range provides a high-quality, sustainable packaging solution for meal kits and premium grocery items, keeping them ambient, cool, chilled, or frozen.

It comprises a variety of fibre-based containers with thermal insulation to protect the unique properties of food and grocery items and to keep product at an optimal temperature throughout the delivery process. The advanced technology of the Thermal Home Delivery range allows for packages to be left unrefrigerated for a longer period of time, providing greater flexibility for delivery options.

Find out more

To discuss how Visy can tailor a sustainable packaging solution for your business, please call 13 VISY (13 8479) or visit visy.com.

** Source: Ibis World Online Shopping – April 2020*

Working together to boost children's veg consumption

A $4 million, five-year national project is helping to address the significant underconsumption of vegetables by Australian children. This project is bringing together science and industry, with CSIRO, Flinders University and Nutrition Australia working together to deliver an integrated approach to improve these consumption figures through the education of children, training for educators and engagement with industry. *Vegetables Australia* reports.

Tools and interventions for increasing children's vegetable knowledge – VegKIT (VG16064) is a strategic levy investment under the Hort Innovation Vegetable Fund, and its aim is clear: to increase the vegetable intake of Australian children.

Designed to provide a collection of practical tools, resources and interventions, the five-year project centres around six key activities to support children, educators, and health care professionals, and engage with industry.

"We are focusing on children because 95 per cent of children don't eat the recommended intake of vegetables," CSIRO Project Lead Dr David Cox said.

"Establishing a liking for vegetables in childhood will set up a life-long demand for vegetables. This project is about getting children to enjoy vegetables, using knowledge about the development of taste preferences, and then using this information to find practical ways of addressing the problem.

"VegKIT aims to increase children's daily intake of vegetables by more than half a serving per day."

The project is delivering **six key activities**:

1. Best practice guidelines to increase vegetable intake in children.
2. A national online registry of initiatives to increase vegetable intake.
3. Development and coordination of the Vegetable Intake Strategic Alliance (VISA).
4. Updated dietary advice for maternal, infant and early years, using evidence-based knowledge of flavour exposure and food preference development, to facilitate children's vegetable intake.
5. Initiatives in the community (for long day-care settings) to increase children's vegetable intake.
6. Supply chain initiatives (industry innovations and early primary school settings) to increase children's vegetable intake.

A collaborative effort

The project is being delivered by CSIRO, Flinders University in South Australia, and Nutrition Australia Victoria Division along with vegetable industry partners Perfection Fresh and Tony and Mark's, and a non-government organisation, Healthy Kids Association.

A Vegetable Intake Strategic Alliance (VISA) has been established to capture a wide range of stakeholders including the horticulture industry, state and federal departments, nutrition and health agencies, research organisations, retailers, early learning and parenting organisations and various non-government organisations.

"VISA is working to leverage knowledge, funding and collaboration to achieve a shared vision of increased vegetable consumption among children and their families," Dr Cox said.

"The intended outcome of VISA is to facilitate and inform future development and implementation of evidence-based initiatives that create long-term and sustained increases in children's vegetable consumption."

Veg guidelines

The VegKIT project has seven guidelines, which are grouped into three segments (see Figure 1). Dr Cox explained why these were developed by the project team.

"Despite a range of initiatives and programs that aim to improve children's diet quality, few are effective in substantially increasing vegetable consumption long-term. Therefore, →

children's intake of vegetables remains below the recommended level for good health and well-being," he said.

"We developed a set of updated best practice guidelines using the latest scientific literature and are currently turning these into strategies for implementation by different stakeholders."

To date, the project has created user guides for specific intervention to increase vegetable consumption, from long day care to primary school and out-of-school care.

"In this project we wanted to focus on places where children spend their time; on people who directly impact children's vegetable intake through food provision; and on education environments," Dr Cox said.

"We also wanted to focus on academic and policy makers who design programs to promote vegetables. All of these groups have an important role to play in increasing Australian children's vegetable intake."

Identifying barriers

The project has revealed that telling children to eat their vegetables for health or trying to bribe them will discourage consumption.

"We have recognised that kids eat what they like and that vegetables are a challenge, because they are not innately liked. But children can learn to like them if they are made available, on a regular basis, in a wide range of eating occasions and settings," Dr Cox said.

"So, we are focusing on food preference development and the sensory qualities of vegetables and evidence-based behavioural techniques; for example, making vegetables available as an easy choice. We know that childcare doesn't always find it easy to make vegetables available, so we are partnering with a supplier to make this easier in long day care and teach kids about veg.

"We also know that very few vegetables are currently provided in primary school canteens, so we have identified ways of adding vegetables to offerings.

"Children like certain qualities of foods (e.g. sweetness) so we have used that knowledge to develop new product concepts more suitable for children."

It has also been found that engaging with families to increase children's vegetable consumption is important.

"We are working through settings where children eat and learn, and away from the possible battlefield that is the family meal," Dr Cox said.

"We are supporting families indirectly by teaching kids to like vegetables while they are at childcare or at school. The aim is that they will take these new food preferences home with them."

There has also been collated evidence on flavour transfer through the womb and breastfeeding that may pre-dispose infants to like the flavours of vegetables.

"We have identified that repeated exposure at weaning, particularly to a variety of vegetables, will teach infants to like the flavour of vegetables. We are currently assessing the strength of this evidence to see if dietary advice to parents can be refined to be more vegetable orientated," Dr Cox explained.

Through the VegKIT's 'resource registry', the project team is facilitating information sharing and best practice for encouraging vegetable consumption across a wide range of settings, including community initiatives. This can be found on the VegKIT website: vegkit.com.au.

Further activities

The VegKIT website has recently been refreshed to provide resources by settings and sectors, including for growers.

"The resources will be promoted though engagement activities with each setting and, in that respect, growers can help promote what we have through their professional and personal networks, for example, asking if your child's school or childcare is teaching about and providing vegetables," Dr Cox said.

"We hope that the recently formed Fruit and Vegetable Consortium (FVC) will also provide an avenue for promoting behavioural-based changes and we will be working as a partner in the FVC.

"Our long-term aim is to raise consumption by half a serving and we will need a sustained effort over many years to make such a change, requiring all stakeholders, including growers, to continue with this effort."

Figure 1: The seven VegKIT project guidelines. Courtesy of CSIRO.

The bottom line

VegKIT has brought together stakeholders that work together to increase the demand for vegetables, in an age when demand for vegetables by children is static or possibly declining.

"The importance of turning this around cannot be stressed enough as it has enormous implications for the industry and public health outcomes," Dr Cox said.

"There is potential to increase demand for fresh produce by 19,000 tonnes per year if every child (aged 2-6 years) increases consumption by greater than half a serving – demonstrating a great return on research investment."

Find out more R&D

Please contact Dr David Cox at david.cox@csiro.au or visit the VegKIT website: vegkit.com.au.

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

Project Number: VG16064

Hort Innovation Strategic levy investment | VEGETABLE FUND

Planning for the VegKIT project

The current VegKIT activities had development phases that first created a strategic plan (*A Strategy to Address Consumption of Vegetables in Children*; VG13090) and then an implementation plan (*Implementation Plan for Increasing Children's Vegetable Intake*; VG15005). Both projects were strategic levy investments under the Hort Innovation Vegetable Fund.

"By reviewing the evidence and involving a broad range of stakeholders, including an early iteration of the Vegetable Intake Strategic Alliance, we have focused upon what is likely to be the most effective activities involving many skills across a range of stakeholders," Dr Cox said.

Other R&D projects

The project team is also leveraging from other vegetable levy investments. One is *Educational opportunities around perceptions of, and aversions to, vegetables through digital media* (VG16018), led by chef and media personality Alice Zaslavsky. Alice has featured in a VegKIT video discussing best practice for long day care providers.

Another is *Development of a vegetable education resource* – stage 2 (VG15067). Through this project, a primary school curriculum aligned sensory education resource for teachers is being rolled out as 'Taste & Learn'. This will be adapted for use in long day care settings for younger children. More can be found at research.csiro.au/taste-and-learn.

A juvenile ladybird. Image courtesy of IPM Technologies.

The impact of pesticides on beneficial species

A strategic levy investment has been gathering information on the impact of pesticides on insects and mites that play a beneficial role in the Australian vegetable industry. To help improve pest management with minimal and appropriate use of insecticides, user-friendly management guides have been developed for vegetable growers and their advisors. Project Lead Jessica Page and Paul Horne from IPM Technologies report.

Integrated Pest Management (IPM) involves using biological control agents (beneficials), cultural controls and pesticides in a compatible way. For this to be successful, the integration of beneficials and pesticides is crucial. Instead of relying solely on pesticides to achieve control, having pesticides and beneficials working together will give better results and is more sustainable.

A range of pesticides are available for growers to apply for pests and diseases in their crops. What is needed is information on the relative impact that these products will have on key beneficial species, so that an informed decision can be made on the likely impact if each one is applied. That information has been difficult to obtain or has not existed until very recently.

A strategic levy investment under the Hort Innovation Vegetable Fund, *Impact of pesticides on beneficial arthropods of importance in Australian vegetable production* (VG16067) has now provided much of that information in an easy to understand and use format. The project was a collaboration between IPM Technologies, Queensland Department of Agriculture and Fisheries and the South Australian Research and Development Institute. It was led by Jessica Page.

Collating information

Firstly, the team looked at what was already known and what was missing. Then each group set about filling in as many of the missing pieces of information as possible. All testing was done in the laboratory and is what is often referred to as a 'worst-case scenario'. Therefore, the impact of a single application in outdoor crops will probably be less severe, but the relative impact of each pesticide can be seen. All results are based on a single application at the highest label rate.

The vegetable industry is very diverse, and there are vastly different production systems with different pests, different beneficials and different pesticide registrations. To make it easy for the information to be used, the study looked at seven different types of vegetable crops and the pests, beneficials and pesticides in each.

These groups were: leafy vegetables and head lettuce; cucurbits and fruiting vegetables; sweet corn; legume vegetables; stalk and stem; root and tuber; and brassicas.

In recent years, there has been a shift by most of the major pesticide producing companies away from broad-spectrum products to selective or 'soft' IPM compatible products. However, these newer products still have an impact on some species. The availability of these newer products makes implementing IPM much more possible, but the lack of information on what they do to different beneficials has still been a major impediment to successful adoption of IPM.

What is sometimes difficult to understand is that one pesticide can be safe to some species and toxic to others, while another pesticide can be safe or toxic to a different set of species. There is no way of predicting what any of these newer pesticides might do to any particular species, so the only way to find out is to test each one. There is obviously an unending set of combinations of pesticide and beneficial species, and this project set out to test only the most relevant combinations for IPM users growing vegetables in Australia.

The results are presented in a way that immediately shows the relative impact of each pesticide on the beneficials of importance in each crop type. The intended use of the guides is as support tools for growers and advisors wanting to use IPM or give IPM advice. They are not intended to describe any product as good or bad, or safe or not safe, but to ensure that informed decisions can be made when choosing a pesticide.

The guides

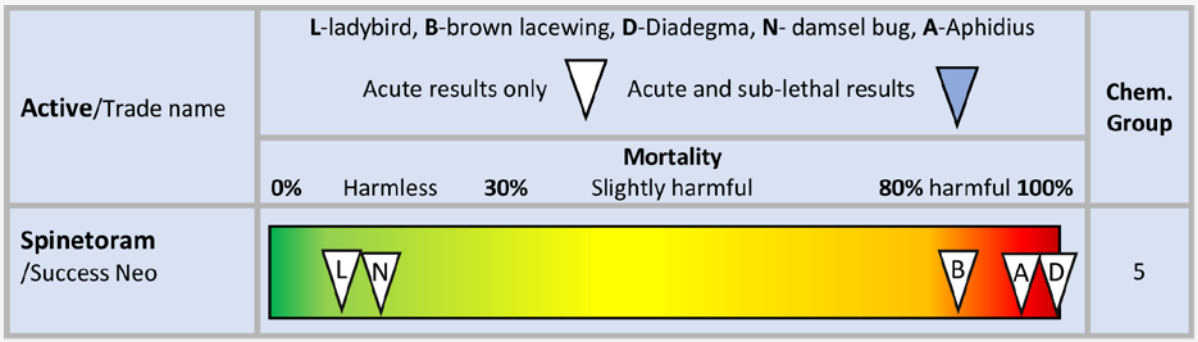
The relative toxicity for each species is indicated on a scale from 0 per cent to 100 per cent mortality as shown in the example below. A blue triangle indicates that the results are a combination of both acute and sub-lethal. A white triangle means acute results only (see Figure 1).

The guides are available to download and print from the AUSVEG website: ausveg.com.au/biosecurity-agrichemical/crop-protection/#IPM.

Figure 1:

How to interpret this guide

The relative toxicity for each species is indicated on a scale from 0% to 100% mortality as shown in the example below. This example shows that Spinetoram is safe to ladybirds (**L**) and damsel bugs (**N**) but is harmful to Diadegma (**D**) Aphidius (**A**) and Brown lacewings (**B**).



The decision to use this product will therefore be influenced by:

- Is there another product that could be used that is less disruptive?
- How many other products have been used and what impact did they have on beneficials?
- Will there be an economic loss if this product is not applied?

Find out more R&D

Please contact Jessica Page at jessica@ipmtechnologies.com.au.

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

Project Number: VG16067

Hort Innovation Strategic levy investment | VEGETABLE FUND

A trial of precision agriculture technologies at a Victorian vegetable farm highlighted the problem areas of the farm that were affecting yield and needed targeted action.

Precision ag pays off in bumper celery crop

A Victorian vegetable farm is reaping the benefits from a trial of precision agriculture technologies to improve soil and crop health. In this edition, the Soil Wealth ICP team delve into some of the key findings from the project's demonstration site at Koo Wee Rup. *Soil Wealth ICP Phase 2* (VG16078) is a strategic levy investment under the Hort Innovation Vegetable Fund.

Since 2018, vegetable growing operation Schreurs & Sons has explored the application of precision agriculture in celery, leek, and baby leaf production systems at its Koo Wee Rup farm, about 80 kilometres south-east of Melbourne.

A range of technologies were trialled at the site, including drones, EM38 mapping, gridded soil sampling, variable rate fertiliser spreading and remote monitoring of pests and beneficial insects. These technologies were put to the test to find out how they could deliver greater production efficiencies and better returns, which will ultimately support the sustainability of the farm and the business.

Key findings

- **Improved uniformity of nutrient availability through variable rate spreading:** This process allows fertiliser to be applied at different rates depending on the changes in soil chemistry across the block, which can achieve a more consistent and high-quality cash crop through more precise application of nutrients. Large areas of the trial site showed an increase in pH to desirable levels, more consistent levels of potassium, phosphorus and magnesium, and lower average levels of sodium.
- **Reduced soil-borne disease risk and severity:** This occurred over time at the site and was more pronounced in the trial area compared to the control. The most significant reductions were in *Pythium spp.* (to moderate levels) and *Rhizoctonia spp.* (low levels) in the trial area. This may be due to the precision agriculture activities at the trial site as well as other factors such as soil moisture, temperature and variation in planting times.
- **Faster in-field monitoring of plant nutrient uptake to inform decisions:** More precise nutrition and drainage management corresponded to improvements and consistency in the celery nutrient uptake during the summer growing season. A comparison of field and lab sap testing showed the value in faster in-field monitoring across a number of sample points in the trial area.
- **Digital insect scout monitored crops around the clock as a 'back up':** From October to December 2019, the project team more actively used and calibrated the remote monitoring insect trap for early detection of relative pest pressure and indication of the reliability of flights (timing and duration), which has been changing in the region over the years. However, it was still important to have conventional scouting to correctly identify pest species and inform control options at the farm.
- **More consistent marketable yield from treated areas:** Yield assessment data showed a significant improvement in the consistency of the 2020 crop, where the degree of variability was between 4-12 per cent. This compared to the 2019 crop, where the degree of variability was between 45-53 per cent across multiple samples within the trial block. This meant easier grading and packing of celery and the ability to supply customers with a product that better met their specifications.

Schreurs & Sons Director of Field Operations Adam Schreurs said the trial highlighted the problem areas of the farm that were affecting yield and needed targeted action.

"The trial has turned the worst performing part of my farm into the best performing part of my farm. It's a massive turnaround in two years," he said.

"The harvest from the demonstration site this year (2020) was so uniform. It was really noticeable when it was coming off the block. It was a fantastic result – it beat the best crop off the farm."

Soil biology and cover crops:
Take a closer look beneath the surface

Soil biology is a complex, dynamic and broad field.

A recent webinar recording from the Soil Wealth ICP team delves into the impact of cover crops on soil biology using DNA sequencing technology. This process provides information on soil bacteria, fungi and eukaryote communities to see what changes occur in vegetable soils following cover crops.

Join Dr Kelvin Montagu from the Soil Wealth ICP team and microbial ecologist Dr Shane Powell from the University of Tasmania as they consider the questions:

- How diverse are biological communities in vegetable soils?
- Do cover crops impact microbial communities?
- How do soil properties and management impact the microbial community?
- What impact do biofumigants have on the soil microbial community?

You can also find out what has been learnt from four sites that have been studied across Queensland to Tasmania.

Find out more

To watch the webinar recording, visit soilwealth.com.au/resources/webinar-recordings/cover-crops-and-soil-biology-in-vegetable-soils.

Optimising cover cropping project for the Australian vegetable industry has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

Project Number: VG16068

Find out more

To access a case study and podcast that further explore the key findings and lessons learned at the demonstration site, visit soilwealth.com.au/resources/case-studies/precision-ag-pays-off-in-bumper-celery-crop-koo-wee-rup-demonstration-site-case-study.

Soil Wealth ICP would like to thank project partners Schreurs & Sons, Stuart Grigg Ag-Hort Consulting, Brown's Fertilisers, Precision Agriculture, OneHarvest and Metos – Australia & NZ.

For more information, please contact project leaders Dr Gordon Rogers on 02 8627 1040 or gordon@ahr.com.au and Dr Anne-Maree Boland on 03 9882 2670 or anne-mareeb@rmcg.com.au.

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

Project Number: VG16078

Hort Innovation Strategic levy investment | VEGETABLE FUND

Preparing for exotic leafminers: a threat to Australian horticulture

Exotic leafminers such as vegetable leafminer (*Liriomyza sativae*), potato leafminer (*Liriomyza huidobrensis*) and American serpentine leafminer (*Liriomyza trifolii*), are significant global pests. In 2015, vegetable leafminer was detected along Australia's Cape York Peninsula. This article outlines how surveillance can help industry prepare for the potential arrival of other exotic leafminers.

Internationally, exotic leafminers have been known to cause problems early upon arrival before chemical management plans have been adjusted to conserve beneficial insects.

Knowing this, surveillance of exotic leafminers across Australia's horticulture industries is critical to ensuring that correct chemical choices can be made as soon as exotic leafminers arrive, to avoid sudden outbreaks and crop losses, and increase the chance of local containment or eradication.

A three-year cross-industry project has resulted in surveillance and management recommendations. Project partners include project lead Cesar; University of Melbourne; Plant Health Australia; the Department of Agriculture, Water and Environment's Northern Australia Quarantine Strategy; and AUSVEG.

Early detection surveillance should be undertaken in high risk crops and during high risk periods, when climate suitability for the pests are high. These crops include Fabaceae, Solanaceae, Cucurbitaceae, Apiaceae, Brassicaceae, Asteraceae, Alliums, and many ornamentals.

A web-based tool is now available for exploring risk of exotic leafminer across region and season (see Figure 1). Surveillance will be particularly important when a high-risk season overlaps with young crops, because young crops are particularly susceptible to leafminer damage.

Figure 1: Predicted seasonal risk of Liriomyza sativae across eight Australian horticulture production regions.

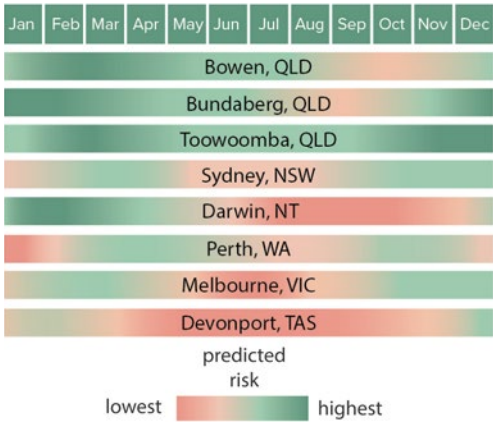
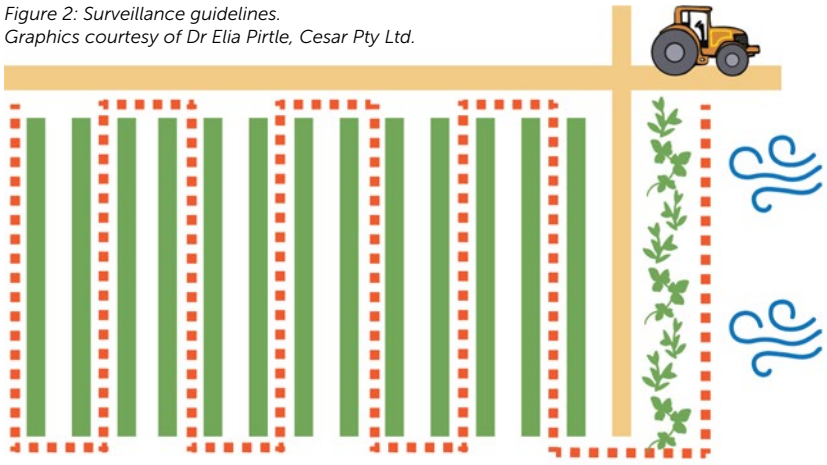


Figure 2: Surveillance guidelines. Graphics courtesy of Dr Elia Pirtle, Cesar Pty Ltd.



How do I survey my farm?

To survey your farm as part of an early detection approach, choose a block of crops – at least 30 rows of plants – that may be at high risk as a result of being an at-risk crop, near to transport routes and unloading areas, or on the incoming wind side of farm or paddock edges.

Within the block, survey by following a snaking transect line (see red dotted line in Figure 2), which includes broadleaf weeds present along the edges of the block and travels down every other row of plants. Grasses do not need to be inspected. Scan the upper surfaces of the leaves as you walk, looking for signs of stippling or mining (see Figure 3), at a slow walking pace of 10 seconds per metre to ensure high confidence in your ability to detect leafminer damage. Always record your survey results.

If you think you see suspicious damage: take a photo, collect a sample of leaves bearing the suspicious damage, and record the GPS point.

It is important to collect at least three mined leaves, but preferably as many as possible. Label the bag using a permanent marking pen with the following information: name; contact number; date; address, town, postcode; crop type.

Once the sample has been collected and stored, immediately report the suspicious damage to the Exotic Plant Pest Hotline on 1800 084 881. This will put you in touch with the Department of Primary Industries or Agriculture in your state or territory.

What if these pests become established?

The most effective natural control of leafminer is parasitoid wasps. Australia has at least 50 species of parasitoid wasps that attack native leafminer flies, and many are known to attack exotic leafminers overseas. If exotic leafminers establish in Australian production regions, they should be managed using an integrated pest management approach, which will allow parasitoid wasp populations to build up.

Regular crop monitoring will also be crucial for management. Using sticky traps is another useful way to monitor leafminer populations, because they attract adult leafminers and may give an indication of when leafminer flies are moving into the crop. Pupa trays identify whether active fly populations are present around leaf mines – these also an important and easy-to-use monitoring tool.

Furthermore, appropriate chemical choices within Australia have also been identified and several permits are now secured for future management.

Figure 3: Liriomyza sativae damage to siratro.
Image taken by Dr Elia Pirtle, Cesar Pty Ltd.

Find out more R&D

For more information, contact AUSVEG Biosecurity Officer Madeleine Quirk on 03 9882 0277 or madeleine.quirk@ausveg.com.au. Alternatively you can visit the project page on the AUSVEG website at ausveg.com.au/biosecurity-agrichemical/biosecurity/mt16004/.

Any unusual plant pest should be reported immediately to the relevant state or territory agriculture agency through the Exotic Plant Pest Hotline (1800 084 881).

The project *RD&E program for control, eradication and preparedness for vegetable leafminer* (MT16004) has been funded by Hort Innovation using the vegetable, nursery, melon, and potato research and development levies and contributions from the Australian Government.

Project Number: MT16004

Hort Innovation

Industry resources

The MT16004 project team has developed preparedness and management guides to provide support on surveillance and monitoring. Visit ausveg.com.au/mt16004 to access these guides.

There is also a series of short, informative webinars that delve deeper into leafminer risk, surveillance and management. Visit the AUSVEG YouTube Channel to view these webinars: youtube.com/ausveg.

Report sheds light on profitability of WA vegetable growers

The third annual vegetable industry financial and production benchmark report has been released by vegetablesWA and its partner Planfarm, revealing important data on the profitability and key financial performance of Western Australian growers. This article has been provided by vegetablesWA, and first appeared in the winter 2020 edition of *WA Grower* magazine.

A strategic levy investment under the Hort Innovation Vegetable Fund, *Vegetable business benchmarking* (VG17000) assesses the financial performance of the vegetable industry across Western Australia, while providing individual growers with a financial analysis of their business.

The project has led to striking increases in the profitability of some participating businesses, which span across the full length of WA; from Carnarvon, Geraldton, Gingin, and metropolitan Perth right through to Manjimup and Myalup.

vegetablesWA Benchmarking Lead Bryn Edwards said the financial and production benchmark report analysed data from the full range of vegetable crops grown during the 2018-2019 financial year.

"What is really powerful this year is that in addition to the single financial year 2018-2019 results, we've been able to produce three-year averages across the key financial measures and metrics," Bryn said.

"Having access to three years' worth of financial data from growers now provides a new level of rigorous insight that has not been available to growers previously.

"Producing this level of data around return on capital, operating profit and operating efficiency measures provides clear insights about just how viable vegetable growing is compared to other asset investment options. It also highlights areas of potential growth in terms of future profitability to be gained."

Bryn explained that having a more rigorous, longer-term understanding of the industry is an extremely important step towards providing vegetable growers with key information that will empower them to make shorter- and longer-term business decisions with confidence.

"Having access to these detailed insights plays a role that will begin to set the WA vegetable industry apart from any other state," Bryn said.

Facts and figures

According to the data, an average return on capital for the financial year 2018-2019 was eight per cent, and the three-year average is nine per cent.

Planfarm Director Paul Omodei said the third-year results revealed again that the most profitable growers (as measured by vegetable operating profit per hectare) were not those from a particular area, of greater scale or a particular vegetable type.

"We found that the most lucrative growers were focused on driving a higher income per hectare, through increased saleable yield and a strong focus on marketing their product, while actively managing costs," Paul said.

While this demonstrates that generating a good return is open to all WA growers, Paul said that the findings also suggest that there's more profitability left on the table that could be in the pockets of vegetable growers.

Setting the benchmark: Three years on

After publishing the third year of vegetable industry benchmarks, vegetablesWA Benchmarking Lead Bryn Edwards has shared his thoughts, reflections and observations from the past three years.

"Taking those first growers through the process of gathering up data, analysing and then sitting with them to critically analyse the results, was super rewarding as I could visibly see the impact that I knew process would deliver to those who got involved," Bryn said.

"Through engaging with more growers and listening to them, I began to realise that a core reason behind the lack of take-up was a widespread gap in understanding relating to the dynamic relationship between strategic planning, managing figures, business management, marketing and informed decision-making. And how, by understanding this, it can put you in greater control across your business."

Bryn said that over the past three years, vegetablesWA has seen growers make impressive improvements and changes, extending beyond the financial performance of their business to their standard of life with their family beyond the farm.

However, he acknowledges that further work needs to be undertaken in the benchmarking space.

"The industry faces many challenges, and successful businesses can meet these challenges more successfully from a place of inside knowledge and informed decision-making," Bryn said.

Find out more

To read the full column, turn to pages 86-87 of *WA Grower* – Winter 2020 or visit issuu.com and search for 'WA Grower magazine'.

When examining the operating efficiency metrics, which Mr Omodei explained is the ratio of operating costs as a percentage of income, the 2018-2019 financial year industry average was 74 per cent, while the three-year industry average is 72 per cent.

"This means growers are spending on average of 74 cents and 72 cents respectively to make $1 before paying for finance, tax, depreciation, land leases, or management drawings," he said.

"We'd like to see that figure closer to 65 cents, as the top 25 per cent of growers are averaging 60 cents of operating costs to make a dollar, which shows that it is achievable."

In terms of impact on growers at an individual business level, Paul said he had been pleased with how participating growers have acted on the feedback they had received.

"We have worked very hard to support those growers that have participated in the benchmarking initiative to turn their individual findings into tangible actions and changes they can make in their business," Paul said.

"This has paid off as we've seen some significant improvements and increases in profitability over the past three years."

Strategic planning

The benchmarking initiative is not solely about increasing the profitability of horticulture businesses. Bryn explained that it also places an emphasis on accelerating business management skills and strategic thinking.

"Over the past three years, we've seen growers make some impressive improvements and changes – this extends beyond the financial performance of their business and strategically into their standard of life with their family and beyond the farm," he said.

vegetablesWA CEO John Shannon said the findings of the report have a wider and more timely impact than originally foreseen.

"The three-year averages will be a critical measuring stick when assessing the true impact of COVID-19 on the industry and understanding exactly where all business recovery efforts should be targeted," John said.

To download a copy of the report and watch a detailed presentation of the findings, please go to vegetableswa.com.au/benchmarking. The WA Vegetable Industry Benchmarks Report was produced by vegetablesWA together with Planfarm, with funding from the Department of Primary Industries and Regional Development's Agribusiness Innovation Fund and Hort Innovation.

Figure 1: 2018-19 Return on Capital
Source: *Western Australia Vegetable Industry Benchmarks 2020* report

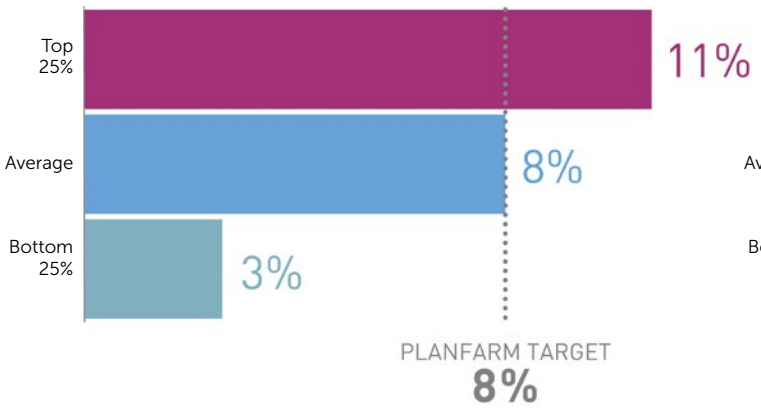
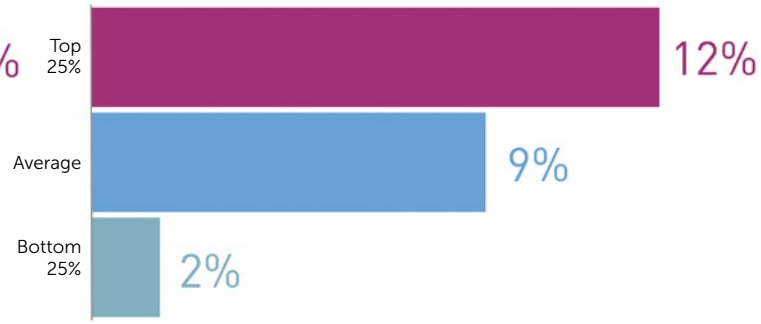


Figure 2: Three-Year Average Return on Capital
Source: *Western Australia Vegetable Industry Benchmarks 2020* report



Find out more R&D

Please contact vegetablesWA Benchmarking Lead Bryn Edwards on (08) 9486 7515 or at bryn.edwards@vegetableswa.com.au.

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

Project Number: VG17000

Hort Innovation Strategic levy investment | VEGETABLE FUND

Jimmy, Sarah and Emily Kalafatis from Kalafatis Fresh in Goulburn Valley, VIC.

Jason Jarvis from Twin Apple Packhouse in Donnybrook, WA.

The Cantrill family from Cantrill Organics in Nashdale, NSW.

Supporting organic growth in the fresh produce sector

More than $1 million in new grants has been awarded to four organic farms across Australia in the third round of the Woolworths Organic Growth Fund. The $30 million Fund was established in 2018 in partnership with Heritage Bank to help Australians farmers meet growing consumer demand for organic fruit and vegetables.

The four successful recipients in the third round of the Woolworths Organic Growth Fund – Cantrill Organics, Kalafatis Fresh, Wattle Organic Farms and Twin Apple Packhouse – grow a wide range of fruit and vegetable varieties on farms based in New South Wales, Victoria and Western Australia.

Woolworths General Manager of Fruit and Vegetables Paul Turner said Woolworths is proud to be backing the expansion plans of entrepreneurial farmers across Australia through the Fund.

"We're seeing double digit growth in customer demand for organic fruit and vegetables, and believe the trend will only continue over the coming years," Mr Turner said.

"As we look to the next round, we'd particularly like to encourage applications from conventional growers who are looking to diversify crops and convert to organic production."

Kalafatis Fresh Produce Managing Director Jimmy Kalafaits is a grant recipient who has seen the consumer shift towards organic produce.

"Consumers are putting more organic produce into their shopping baskets every week – that's what we're seeing, and what the statistics are telling us," Mr Kalafaits said.

"Australians are becoming more educated about how their food is produced and are looking more to methods of growing produce that don't require chemicals or pesticides."

Below is a brief overview of the round three recipients.

Cantrill Organics: Nashdale, New South Wales

Cantrill Organics has secured a $170,000 Woolworths Organic Growth Fund grant to continue to purchase new cherry varieties, as well as funding for infrastructure upgrades to solar panels, the pack shed and upgrades to the dam.

Operating Australia's largest organic cherry orchard, Cantrill Organics is a family-owned farm in Nashdale, near Orange in New South Wales.

The Cantrill Family has been farming in the Orange district for nearly 170 years and is committed to providing certified organic, high quality produce including cherries and a variety of other organic crops.

The family transitioned to full organic certification about 12 years ago and is continually searching for cost-effective, risk reducing and sustainable ways to produce an organic crop that provides customers with the best and freshest product possible.

Kalafatis Fresh: Goulburn Valley, Victoria

Kalafatis Fresh will use its $500,000 grant to help purchase orchard infrastructure to farm organic pears and plums. The infrastructure will include a vertical espalier trellis to cover the crop with pest-proof netting.

An irrigation system will also be established above the orchard floor to allow for mowing between the trees, a critical task when herbicides aren't in use. A commercial-sized mower and sweeper will be purchased under the grant for the sweeping and mulching of leaves to reduce potential infection from fruit diseases like black spot and canker.

Wattle Organic Farms: Lake Boga, Victoria

Wattle Organic Farms had its beginnings more than 10 years ago, with the aim of producing healthier and more sustainable fruit and vegetable crops. The property is run by Nathan Free and his parents, Kelvin and Deanne, at Lake Boga near Swan Hill in Victoria. They grow 130 hectares of certified-organic land devoted to the year-round production of vegetables and stone fruit. The $80,000 grant will allow the Frees to expand and improve their most in-demand stone fruit lines.

Twin Apple Packhouse: Donnybrook, Western Australia

Twin Apple Packhouse (branded as Prime Organics in WA) is a family-owned and operated Certified Organic apple orchard located at Donnybrook, in the heart of the Geographe fruit-growing region, south of Perth.

Twin Apple Packhouse will use its $300,000 grant to develop a new orchard and help expand production. A long-time organic supplier to Woolworths, the grant will help increase availability of Certified Organic apples with planting in the new orchard and renewing plantings in the existing orchard in 2021.

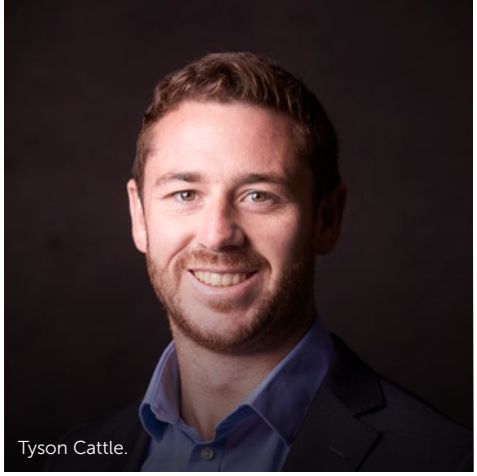
Find out more

For further details or to apply for a grant, please visit woolworths.com.au/organicgrowthfund.

Woolworths has committed to invest up to $30 million over a five-year period in the form of financial grants and interest-free loans. Applicants who successfully apply to the Woolworths Organic Growth Fund for an interest-free loan will be issued the loan by Heritage Bank.

Banding together to solve horticulture's labour issues

The COVID-19 crisis continues to dominate AUSVEG's advocacy activities in 2020. In this column, AUSVEG National Public Affairs Manager Tyson Cattle outlines the major impacts that are being felt across the horticulture sector as a result of this global pandemic – with labour and worker movement at the fore.


Tyson Cattle.

As the COVID-19 pandemic continues to cause issues and change to the Australian and global landscape, so do our advocacy activities for the industry.

We have seen some advocacy success during COVID, with the approval of visa extensions and recognition from the federal level of agriculture and horticulture as an essential service. However, there is still work to be done with state governments to improve state border movements.

At the time of writing, AUSVEG was leading discussions with the National Farmers' Federation Horticulture Council around the development and advocating for a 10-point plan to help solve horticulture's labour issues.

The 10-point plan (see table) is designed to not only help address the immediate labour needs of industry, but also help address labour issues well into 2021 and beyond.

As an industry, we have already seen a significant reduction in Working Holiday Maker numbers from 141,000 to now under 80,000. We are expecting a further reduction in backpackers in the country as we get closer to Christmas and backpackers look to return home.

Bringing workers into Australia

The biggest concern for industry at the moment is the lack of a returning or replacement workforce coming back into the country.

The Seasonal Worker Programme (SWP) pilot in the Northern Territory is a great result. This is not because we believe the planeload of workers will solve the industry's labour woes but because we are hoping, as is the Federal Government, it helps to provide a COVID-safe blueprint to bring in new arrivals to Australia. That blueprint can be utilised for further SWP or Pacific Labour Scheme workers to arrive for work in different states, and even assist with a restart of the Working Holiday Maker program.

Another element of the key points is the focus on domestic displaced workers. All levels of government are very strong on providing opportunities to Australians, particularly as unemployment continues to rise.

We have been discussing with government a range of different options to help deliver a competent, reliable and efficient workforce to growers and we have been clear that it requires a multi-pronged approach to ensure fresh produce continues to hit market shelves.

Grower advice

We urge growers to do their bit and, where possible, advertise their workforce needs via the National Harvest Trail Information Service and lodge their needs as early as possible. This will assist not only their own workforce planning, but government and industry gaining a clearer understanding of the reality of our workforce needs.

The COVID situation is no doubt going to have a lasting impact on a range of industries, including horticulture, and we'll continue to work to ensure growers can continue to produce the food that Australia – and the world – relies on.

10-point plan to solve horticulture labour crisis -

1. Seasonal Worker Programme pilot extension.
2. Incentives for domestic displaced workers.
3. Agricultural Workforce Code introduction.
4. Promotion of opportunities to work in agriculture.
5. Accommodation support.
6. Development of a National Agricultural Workforce Development Network.
7. National Labour Hire Licensing/Registration Scheme.
8. Working holidaymaker restart.
9. Agriculture Visa/Harvest Work Visa.
10. Horticulture Industry Labour Agreement (HILA) additional occupations.

Far out, Brussels sprout: Pest surveillance goes mobile in vegetable crop

Sentinel 2 at Langhorne Creek.

Pest and disease management is an ongoing challenge for our industry and access to accurate and timely information is essential for decision makers on-farm. iMapPESTS aims to provide a framework for a coordinated cross-industry system that can rapidly monitor and report the presence of high-priority airborne pests and diseases. Shakira Johnson reports.

iMapPESTS: Sentinel Surveillance for Agriculture (iMapPESTS) is a national program of research, development and extension designed to put actionable information relating to pest and disease dynamics into the hands of Australia's primary producers, industries, and governments. The timely delivery of this information will support enhanced on-farm pest management, biosecurity response efforts and proof-of-freedom claims.

The program is led by Hort Innovation, through funding from the Australian Government as part of its Rural Research and Development for Profit program, as well as investment from plant industry Research and Development Corporations (RDCs). In addition, in-kind contributions from national and international partner organisations have been received, including South Australian Research and Development Institute (SARDI), Agriculture Victoria (AgVic) and Rothamsted Research (UK).

Over a five-year period (2017-2022), the iMapPESTS program is investigating advanced pest and disease surveillance, diagnostics technologies, including custom-designed and built mobile surveillance units (termed 'Sentinels') that incorporate specialised trapping equipment and technology. Sentinels are deployed in trials at various locations around the country and capture airborne samples that are examined to identify high priority pests and pathogens.

The data and information generated by the surveillance trials are shared with industry through various communication channels and extension activities, an activity being led by AUSVEG, in collaboration with the extended research and industry network.

While the Sentinels trap airborne pests and pathogens, researchers are trialling new and emerging diagnostic tools that aim to speed up the delivery of accurate information on what exactly is captured. In addition to speeding up accurate reporting of target pests, the iMapPESTS diagnostics collaboration is using high throughput sequencing (HTS) to investigate ways to report on a wider range of insects captured by the Sentinels, including pests and beneficials. These techniques have the potential to monitor for pests and vector-borne diseases of biosecurity interest to the industry.

Another element of the diagnostics research involves analysis of the gut contents of high priority pests to better understand their feeding habits, such as the plants they may take refuge in once a crop is harvested, or their preference for one crop over another.

AUSVEG is currently working with SARDI, AgVic and Data Effects to create a dashboard for users to access the outcomes of the Sentinel surveillance and will seek feedback from industry to shape it into a valuable tool to improve pest and disease management.

Sentinel 2 trial: Langhorne Creek, South Australia

The iMapPESTS collaboration deployed the second mobile surveillance unit to a crop of Brussels sprouts at Langhorne Creek, in collaboration with AE Cranwell and Sons. The Langhorne Creek trial commenced in mid-July and monitored airborne pests and pathogens until early September. The region is most well-known for its vineyards; however, there are a variety of crops grown in the area including potatoes, carrots, Lucerne and chickpeas, to name a few.

Sentinel 2, like the prototype Sentinel, features several suction traps on board, including two high volume air samplers to trap airborne spores, a two-metre insect trap and a six-metre insect trap, with a network of smart lure trap devices stationed close by. During the trial, airborne samplers and lure traps targeted high priority targets such as:

- Green peach aphid (*Myzus persicae*).
- Onion thrips (*Thrips tabaci*).
- Western flower thrips (*Frankliniella occidentalis*).
- Diamondback moth (*Plutella xylostella*).
- White rot (*Sclerotinia sclerotiorum*).

Identifying what's in the air around the crop

Molecular testing can deal with large numbers of samples rapidly and accurately. Yet, molecular tests for

Sentinel trapping devices including the two-metre insect trap, spore sampler, and weather station.

many of the pests and pathogens do not yet exist. iMapPESTS includes the development of more diagnostic tests using next-generation sequencing by AgVic, Sugar Research Australia and University of Queensland.

The early trials have highlighted the importance of a combination of traditional methods of identification (morphological identification) and modern techniques as the research investigates the capacity for molecular ID and quantification of in-field samples. It is important that we use both traditional and modern methods. Molecular tests will only identify species for which they have been developed. Morphological identification can identify any pest but is very time consuming, particularly in mixed population samples like those collected by the Sentinel.

The pests collected by the two-metre and six-metre suction traps on the Sentinel can also be compared to gain insight into what might be hanging around in the paddock at two metres, versus what is captured on a regional scale at six metres into the air column. This tall trap generally captures smaller insects caught up in higher wind currents and larger migratory insect. The lower numbers in the two-metre trap indicated good pest control.

Visualising patterns of individual pest and pathogen occurrences, together with weather data, will help researchers and decision makers build an understanding of pest and population dynamics.

The pest and pathogen data is married to corresponding environmental data from the time of trapping and shared via the iMapPESTS website at imappests.com.au/langhornecreektrial.

Planning future deployments

The current suite of three Sentinels are being deployed in growing regions around Adelaide, including Adelaide Hills, McLaren Vale, Virginia and the Riverlands.

The suite of Sentinels is set to expand over the remainder of the year, with Sentinels 4 and 5 launching this spring, and a final unit to be unveiled in early December. They will range in size, deployment method (trailer, skid, modular unit) and composition of traps and other features. These features are being explored to cater to different environments and industry requirements and will be deployed at strategic locations around the country in 2021 for trialling.

By the end of the project in 2022, the team hopes to have a demonstrated a proof-of-concept surveillance system that is suitable to different regions and supported by the appropriate rapid diagnostic tests for key insect pests and pathogens across industry sectors.

The iMapPESTS team will work with growers and industry representatives to understand the best way to communicate and visualise the dynamic pest and pathogen information for end-users. Growers and those involved in plant pest management are encouraged to visit the iMapPESTS website for more information or to get in touch.

Find out more

Please contact Engagement and Adoption Coordinator for iMapPESTS Shakira Johnson on 0433 937 564 or shakira.johnson@ausveg.com.au.

Further details can be found at the iMapPESTS website: imappests.com.au. You can follow the project on Twitter: @iMapPESTS.

This project is supported by Hort Innovation through funding from the Australian Department of Agriculture, Water and Environment as part of its Rural R&D for Profit Program and funding from 16 partner organisations.

Project Number: ST16010

Entomologists inspect trap samples at the South Australian Research and Development Institute.

Bianca Jacques reflects on The Loose Leaf Lettuce journey

Bianca Jacques has always had a passion for farming. Growing up on her family's property, Bianca joined The Loose Leaf Lettuce company when still at high school. Nearly 20 years later, she is the operation's Processing Manager. *Vegetables Australia* spoke to Bianca about her career and what she learnt along the way.

The Loose Leaf Lettuce Company, located at Gingin in Western Australia, is one of the largest growers of lettuce, spinach and rocket in the state.

Owned by Maureen Dobra, her husband Barry and their son Kevan, the operation also processes these fresh, gourmet salad vegetables. At the forefront of this arm of the operation is the company's Processing Manager, Bianca Jacques, who oversees around four tonnes of produce every day. Bianca is currently working part-time after she gave birth to her first child in November 2019 and shares the Processing Manager role with her sister, Justine.

Bianca has worked at The Loose Leaf Lettuce Company for around 17 years. She started at the company as a school student working part-time, and her career has progressed over nearly two decades.

"I just did my job to get where I am today. When things needed to be done, I would do it instead of waiting for someone else to do it," Bianca said.

"If I didn't know how to do a job, I would ask someone to show me so next time I could do it myself. As I learned to do more in the packing shed, I was able to help previous managers and was appointed 2IC (second in command) when I was 18.

"Of course, I wouldn't be here today if it wasn't for Maureen Dobra's guidance and inspiration."

As Processing Manager, Bianca's role is to oversee the running of the packing shed.

"It is my job to liaise with other managers on-farm to make sure we can send out the best quality product that we can. I have a number of staff working in the shed and it's my job to make sure they are all working to their highest standard. So, I do rosters, training and everything in between," she explained.

"Along with the responsibility that comes with being a manager, I have to make sure that stock is kept in supply and ensure that we don't run out of anything. Therefore, a monthly stocktake is done and I order what is needed."

On a mission

Almost three years ago, Bianca attended the 2017 Women's Industry Leadership and Development Mission to Hong Kong, South Korea and Japan, which was a strategic levy investment under the Hort Innovation Vegetable Fund.

The two-week study tour has had a lasting impression on Bianca, who made valuable connections with other vegetable industry members and gained an insight into how other countries grew fresh produce and utilised their farmland.

"It's amazing how different techniques can still yield the same produce," she said.

"I learnt that farming is so important for the younger generation to take on. In Japan, the average age of a farmer is 72. The younger generation has no interest in farming; therefore, Japan only produces maybe 15 per cent of its own produce. The rest is imported.

"Also, I saw that women are just as important and involved with all aspects of the horticulture industry – from seeding, harvesting, packing, selling and

The Loose Leaf Lettuce Company Processing Manager Bianca Jacques with Farm Manager Steve Allie.

networking. Farmers aren't just old men driving a tractor."

While on the tour, Bianca observed how much other countries rely on fresh produce from Australia.

"There's a huge market in Asia and because there isn't much farmland, importing is vital," she said.

The group also attended Asia Fruit Logistica in Hong Kong, which also added to Bianca's knowledge.

"Asia Fruit Logistica was full of so many exhibits such as new seeds, robotics in farming, networking and the possibility of new international clients," she said.

Bianca highly recommends the study tour to other vegetable industry members.

"This is an ongoing industry that is vital for our lifestyle. Travelling or keeping connections to other countries and seeing what's on trend there is important so we can keep up with the market," she said.

Further learning

Throughout her career, The Loose Leaf Lettuce Company has allowed Bianca to access educational resources offered by the peak body of the Western Australian vegetable industry.

"I have been fortunate enough to be able to use the resources that vegetablesWA has offered on more than one occasion," she said.

"It has run a negotiation workshop that myself and a few other Loose Leaf employees attended. I also attended the Industry Summit held at Crown Perth a couple of years ago. There was a lot of information received, as well as guest speakers and networking."

Otherwise, Bianca learns on the job. And while she doesn't grow the produce herself, Bianca has had opportunities to speak to vegetable growers through different networking events and field days.

Advice for others

Bianca is a proud member of the vegetable industry, and she has some advice for women who are looking for a career in horticulture.

"Knowing I'm part of what some almost take for granted – it's pretty special when you go to a restaurant and see the produce that you helped get there," she said.

"I think women already know how important they are to the horticulture industry. Anyone looking to join should jump straight into it. They will be pleasantly surprised as to how many women already work in this sector.

"Most of us are career women or working mums, so we know how important vegetables are in our diet. So, why not become someone who is responsible for growing them?"

About The Loose Leaf Lettuce Company

Located in Gingin, Western Australia, The Loose Leaf Lettuce Company is one of the largest growers of lettuce, spinach and rocket in the state, while it also produces Asian green varieties, including kale.

With over 40 years of growing experience, this family business is passionate about the produces. What once started as a sideline to meet a clients' request for tiny lettuce leaves has developed into an innovative and successful business, providing employment for the community of Gingin and consistently delivering six days a week to customers all over Western Australia and interstate.

Find out more at loose-leaf.com.au.

Exploring practical pollination measures for Australian horticulture

The Pollination Fund is one of seven funds developed under Hort Frontiers, a strategic partnership initiative led by Hort Innovation that facilitates collaborative, cross-horticulture projects. It was developed to create a sustainable and resilient horticultural industry through improved pollination options and services, as pollination is considered a priority for most horticulture industries. *Vegetables Australia* reports.

Pollination is the transfer of pollen grains from one flower to another, and is critical in 60 per cent of agricultural production. It helps the growth of many fruits, vegetables, nut and flower species, and in some instances, can increase crop yield. In Australia, it is estimated that pollination-dependent crops are worth over $4.3 billion per annum, with a direct contribution from honey bees estimated to be over $1.6 billion.

The Hort Frontiers Pollination Fund aims to enhance and support existing pollinators as well as identifying the most effective pollination methods for various horticulture crop types. It also aims to address the needs of growers and supporting beekeepers and their businesses.

"Around 24 out of our 37 horticultural industries are pollination-reliant and that amount varies from 20 per cent to 90-100 per cent," Hort Innovation R&D Manager Ashley Zamek said.

"The Pollination Fund model looks at three different tiers of issues. This includes the health of honeybees, making sure that the honeybees are in the best situation to do their job, free from the pests and diseases that plague them, and are managed to the best of their ability."

The second tier focuses on crop production issues and investigates how crops can become easier to pollinate in both open field and protected cropping situations, while the third tier explores the option of alternate pollinators.

"Having multiple options available is not about getting rid of honey bees, it's about ensuring that there are enough options out there for growers to make the best decision for them, as well as understanding that there are only so many honey bee hives available for pollination," Ms Zamek said.

"As horticulture grows, we need to make sure that producers' needs are met."

Veg industry input

Establishing the Hort Frontiers Pollination Fund has allowed projects to be undertaken that may not have otherwise been possible for the vegetable industry, as Ms Zamek explained.

"For the vegetable industry, that's looking into the use of stingless bees as possible pollinators of glasshouse vegetable crops such as cucumbers and eggplant," she said.

Stingless bees as effective managed pollinators for Australian horticulture (PH16000) is compiling data and reviewing existing evidence on the potential of stingless bees. It is being conducted out of the National Vegetable Protected Cropping Centre, which is a strategic levy investment under the Hort Innovation Vegetable Fund. There are also vegetable growers involved as members of the Project Reference Group, helping to direct the project throughout its duration.

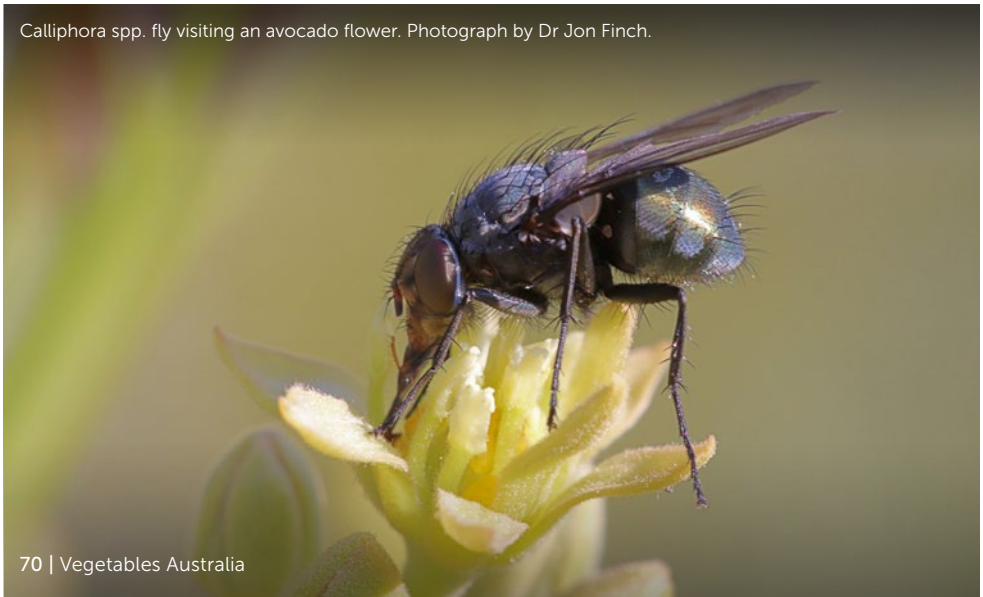
The project is carrying out studies on a range of fruit and vegetable crops, testing if the bees visit the flowers and transport the crop pollen. Where they do, it is then testing the effectiveness of stingless bee pollination and its impact on crop set, yield and quality as appropriate.

"This type of work was really unknown and high-risk, and was probably not at the forefront of the industry to undertake," Ms Zamek said.

"What we've found out is that there really is difference in what you do in fields and in protected cropping. We've been able to look at those two different situations and understand what could work."

Ms Zamek said another project that will benefit the vegetable industry is *Managing flies for crop pollination* (PH16002). This is examining the potential of using flies as alternative crop pollinators, including looking at the effectiveness of specific species in pollinating avocado, berry (blueberry, raspberry and strawberry), hybrid carrot seed and brassica seed crops.

"Flies are known to be very active in the vegetable seed sector. So, we're doing a lot of work trying to understand if we can identify useful fly species to ensure that carrot seed and brassica seed are in constant supply for growers. The use of flies as mass-reared native pollinators is something we haven't looked into before," Ms Zamek said.

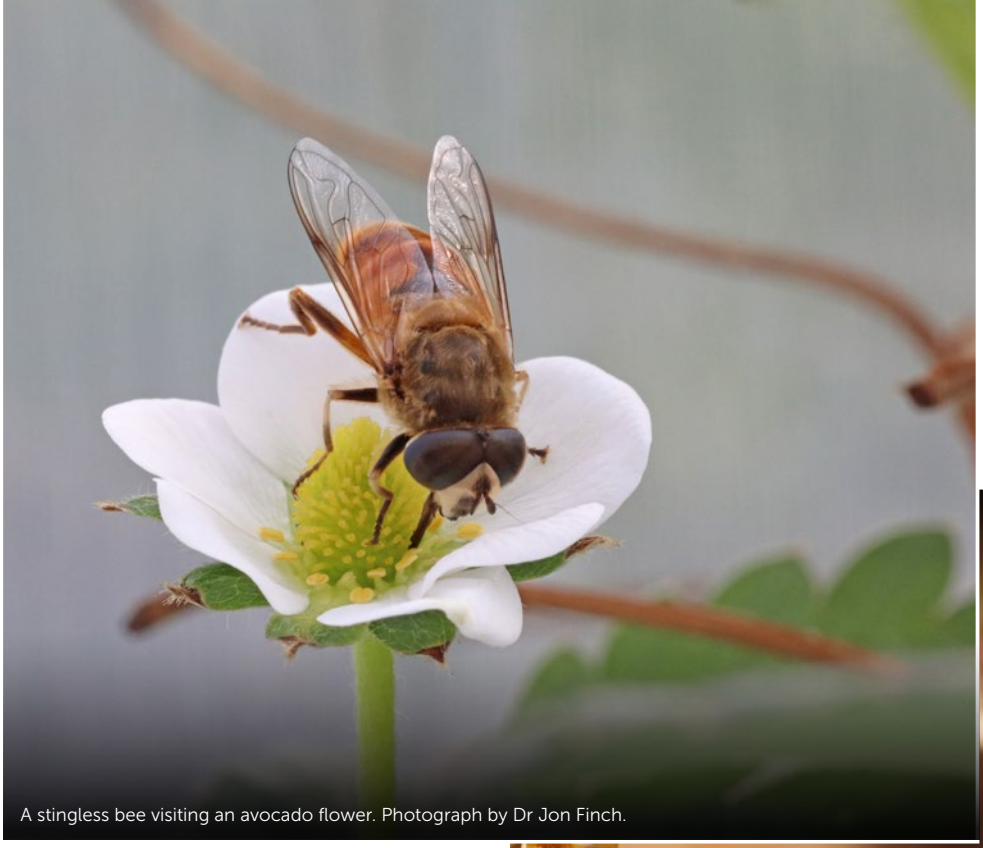


Calliphora spp. fly visiting an avocado flower. Photograph by Dr Jon Finch.

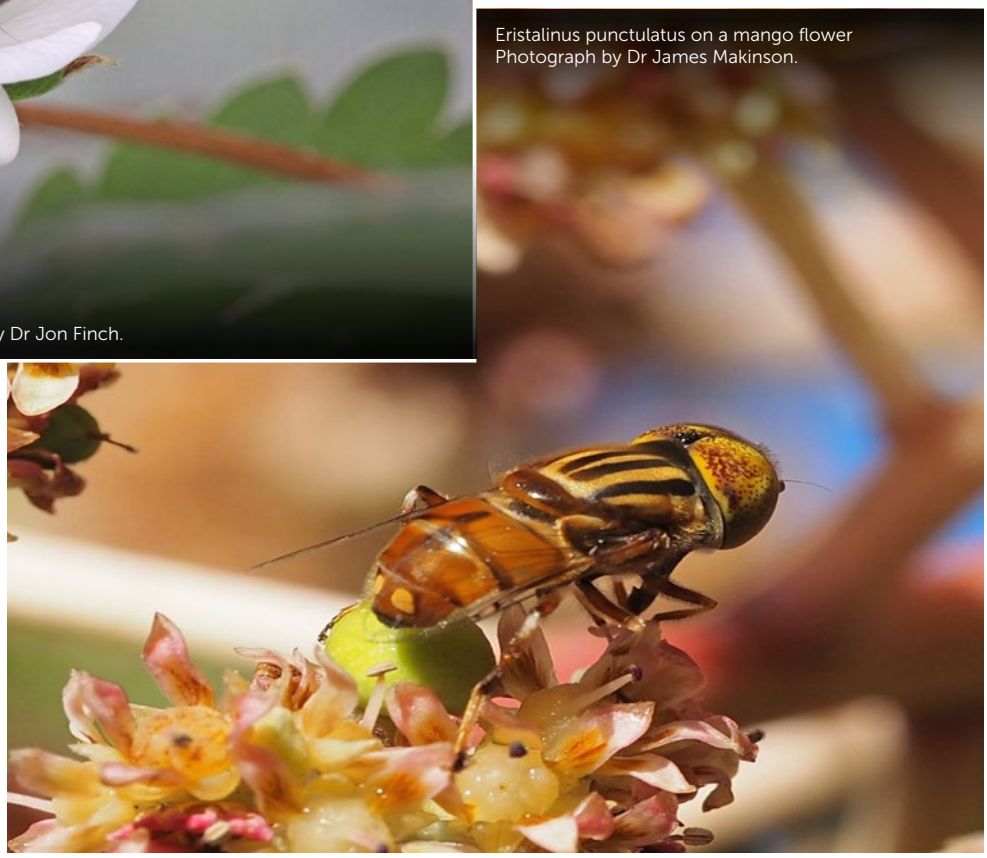
Working together

Under the Pollination Fund, Hort Innovation is working very closely with its Research and Development Corporation (RDC) counterpart, AgriFutures, which represents the honey bee and pollination industry.

Strengthening and enabling effective pollination for Australia (PH15000), *Healthy bee populations for sustainable*



A stingless bee visiting an avocado flower. Photograph by Dr Jon Finch.



Eristalinus punctulatus on a mango flower
Photograph by Dr James Makinson.

pollination in horticulture (PH15001) and the Rural R&D for Profit program *Securing pollination for more productive agriculture: Guidelines for effective pollinator management and stakeholder adoption* (PH16004) led by Agrifutures, work together on some aspects of their projects to maximise the crops and regions that can be targeted across Australia.

"These projects have worked together to map crops across Australia to better understand which pollinators are in the crop and who's moving the pollen where. This has never occurred at such a large scale before, and what these projects have achieved is a really good understanding of the best pollination options for different crops," Ms Zamek said.

Through their research, the two RDCs are committed to supporting the honeybee industry – especially considering the loss of such a significant number of hives during the recent Australian bushfires.

"What we understand is that we need to work together to make sure that the honey bees are available for pollination, as well as ensuring a strong and a productive industry for our beekeepers," Ms Zamek said.

"It's about working together and identifying the key issues that put honey bees at risk. It's not just about bushfires per se; it's about access to resources in general, which has been a long-term ongoing issue, and the ageing of the industry. We want to make sure that it remains a viable, long-term industry."

Ensuring a sustainable future

Ms Zamek said the long-term aim of the Pollination Fund is to establish strong applied science that will ensure growers have options and tools to develop their pollination plan.

"It's about having sustainable options; for example, enabling a mixture of wild pollinators and well-managed pollinators on-farm. It's also going to be an understanding of the important relationship that we can form with beekeepers and those who provide pollination services," she said.

"Our aim is to make sure that we can grow as a horticulture industry and that pollination will not be a limiting factor to that."

Find out more R&D

For further details or to submit an idea for a future project, please contact Hort Innovation R&D Manager Ashley Zamek at ashley.zamek@horticulture.com.au.

More about the Hort Frontiers Pollination Fund can be found at hortfrontiers.com.au/pollination-fund.

These projects have been funded by the Hort Frontiers Pollination Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with funding from a range of co-investors and contributions from the Australian Government.

hort frontiers | POLLINATION FUND

Sharni, Shane and Caitlin Radford. Image courtesy of Rabobank.

Developing evidence of good environmental stewardship

The EnviroVeg Program 2017-2022 is a strategic levy investment under the Hort Innovation Vegetable Fund. In this article, Program Coordinator Danielle Park speaks to Tasmanian vegetable and potato producers and EnviroVeg members, Shane and Sharni Radford, about the value in collecting evidence of good environmental practice for vegetable producing businesses.

In 2019, the EnviroVeg Program underwent a pilot phase and feedback collated from participating vegetable growers was used to drive the next stage.

Involved in this pilot were north-west Tasmanian producers Sharni and Shane Radford, who completed two of the program's three phases. The couple grow a range of crops, including beans, broccoli, carrots, onions, and potatoes, at their Moriarty operation.

As with other vegetable producers, many of the biggest environmental risks facing the Radford's production system have been addressed over the many years of operating on their property. Having evidence to support claims of following environmental best practice has been vital for many years.

"Even in the early days when we were supplying onions to a processor for them to export, there was a need to collect the evidence of doing the right thing," Sharni says.

Over 20 years ago, Shane and Sharni began to tackle the challenges of supplying processing onions for export to England. The experience of assisting the processor to meet another country's environmental requirements, and having to produce evidence of good environmental practices, taught some important lessons.

"The more proactive you are, the better prepared you are for opportunities," Sharni says.

"There's an element of chance if you wait and don't get involved. If you get in first, you can help shape the program to work for you."

This proactive approach led Shane and Sharni to volunteer to test out the revised EnviroVeg program in 2019. This program's pilot phase has been completed, and is now open for vegetable levy-paying growers to join.

The importance of environmental credentials

Increasingly, the question of environmental sustainability is being asked by different sectors. One group asking the question and looking to better understand the practices occurring on-farm, are financial institutions such as banks.

"A program such as EnviroVeg provides documentation that I can use when I'm asked these questions by our bank," Sharni says.

The value of collecting and keeping evidence of good environmental practices over time has also been identified by Sharni.

"Our work 20 years ago with Nature's Choice has now become part of our records, and the information from that program is still useful. It has become a resource for our business," she says.

"Our daughter Caitlin has now joined the business and succession planning has commenced.

"The information and records collected can support both succession planning and new entrants to the business. We have records of practices and farm infrastructure for many years, which has value for our business. It's part of the property value."

Undertaking the new-look program

The first phase of the new EnviroVeg Program is an online self-assessment. This involves identifying the current practices occurring on vegetable farms from 10 distinct aspects of farm operation, including soil management, irrigation, energy use and biosecurity.

A business report is produced once the self-assessment has been completed. This report highlights the business' strengths, or where it has already addressed an environmental risk. It also identifies risks within certain areas or any further investigation that might be needed.

The second phase of the program is EnviroVeg training, where the results of the self-assessment are highlighted.

Sharni attended this training with other EnviroVeg members in Tasmania who were helping to pilot the revised program. There were benefits in reviewing the identified on-farm environmental risks and discussing the short- and long-term practical actions.

This discussion – with other local

The Radford's property. Images courtesy of Sharni Radford.

The Radfords grow a number of vegetable crops, including carrots (pictured).

producers or with key decision makers in the business – has been identified as being very valuable.

Improvement the key

The EnviroVeg Program aims to support and improve environmental management on-farm. It is willing to assist vegetable producers who are looking to improve their long-term environmental sustainability.

When completing their first EnviroVeg self-assessment, many aspects of Shane and Sharni's vegetable production business was already achieving best management practice for environmental sustainability.

Two areas scored a little lower and were flagged as needing further investigation – energy and biosecurity.

One of the steps to improving energy management is to firstly become aware of the energy requirements of different machinery.

In response to their lower score in this area, Shane and Sharni have increased their vigilance in ensuring equipment is maintained and serviced to remain optimal efficiency.

In addition, Shane and Sharni have recognised the need to develop an on-farm biosecurity plan. They now have biosecurity signage, but more work is required.

"We're now looking to further develop our biosecurity plan. Having policies around site-access is something we're considering," Sharni says.

From their EnviroVeg training, Shane and Sharni have been able to review the risks identified. They have since completed a re-assessment, which has resulted in a new farm report and a better result on the benchmark.

What is the EnviroVeg Program?

The EnviroVeg Program was established to improve the longevity of vegetable growing regions; benchmark industry data; and develop industry recognition for environmentally responsible, sustainable production methods.

EnviroVeg is industry-led and promotes best management techniques by providing resources, support, engagement, and a pathway to recognition for vegetable producers.

There are three main objectives to EnviroVeg:

- To support and improve environmental management on-farm.
- To facilitate program recognition of and competitive advantage from EnviroVeg branding.
- Track industry progress regarding sustainable farming practices.

The EnviroVeg program is underpinned by an 'Environmental Best Management Practice' resource. The resource contains up to date information on achieving environmentally sustainable vegetable production.

For vegetable growers looking to assess their current practices on-farm, the EnviroVeg program is one way of identifying opportunities for improvement, as well as benchmarking against others in the industry.

Find out more R&D

Please visit enviroveg.com.au.

For help with accessing the EnviroVeg self-assessment, please contact AUSVEG EnviroVeg Coordinator Danielle Park on 0432 324 822 or at danielle.park@ausveg.com.au.

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

Project Number: VG16063

Hort Innovation Strategic levy investment | VEGETABLE FUND

Minor use permits

Permit Number	Crop	Pesticide Group	Active	Pest/Plant disease/ Target weed	Date Issued	Expiry Date	Permit Holder	States
PER88640	Snow peas, sugar snap peas, lettuce (head lettuce and leafy lettuce), parsley, green beans, celery, rhubarb, eggplant, capsicums, chilies and tomatoes	Insecticide	Spirotetramat	Liriomyza leafminers (*Liriomyza* spp.) [including vegetable leafminers, pea leafminer and American serpentine leafminer]. Suppression only	18-May-20	31-May-23	Hort Innovation	All states and territories except VIC
PER12565	Capsicums (field and protected cropping) and lettuce (protected cropping)	Fungicide	Pyrimethanil	Grey mould	05-Apr-12	30-Jun-25	Hort Innovation	All states except VIC
PER89645	Shallots and spring onions	Herbicide	Linuron	Annual weeds	11-Jun-20	30-Jun-22	Hort Innovation	All states and territories
PER12384 Version 4	Rhubarb	Herbicide	S-Metolachlor	Various broadleaf and grass weeds	18-Nov-10	30-Jun-25	Hort Innovation	All states and territories
PER80558 Version 3	Snow peas and sugar snap peas	Miticide	Bifenazate	Two spotted mite, red tomato spider mite, European red mite and bryobia mite	10-Nov-15	30-Jun-25	Hort Innovation	All states except VIC and NT
PER82895 Version 2	Parsley (foliage only), fennel, spinach, silverbeet, brassica leafy vegetables, spring onions, beetroot, celeriac, parsnip, radish, cucumber, eggplant, garden peas, snow peas and sugar snap peas	Fungicide	Chlorothalonil	Various fungal diseases	04-Aug-17	31-Aug-25	Hort Innovation	*All crops except garden peas:* All states and territories, except VIC. *Garden peas:* WA only
PER82461 Version 2	Beetroot, beetroot leaves, chicory, endive, radish, silverbeet, spinach and carrots	Fungicide	Tebuconazole	Sclerotinia and powdery mildew	16-Aug-17	31-Aug-25	Hort Innovation	*Beetroot, beetroot leaves, chicory, endive, radish, silverbeet and spinach:* All states and territories, except VIC. *Carrots:* NSW, SA and TAS only
PER82467 Version 3	Cucumber, zucchini, squash, choko, eggplant, peppers, capsicum, leafy lettuce and celery	Insecticide	Buprofezin	Greenhouse whitefly, sweet potato whitefly, silverleaf whitefly, whitefly, jassids and leafhoppers	07-Jul-17	30-Jun-25	Hort Innovation	All states and territories except VIC

Permit Number	Crop	Pesticide Group	Active	Pest/Plant disease/ Target weed	Date Issued	Expiry Date	Permit Holder	States
PER12357 Version 4	Parsnips	Herbicide	Linuron	Grass and broadleaf weeds as per the approved label	09-May-12	31-Jul-25	Hort Innovation	All states and territories except VIC
PER81260 Version 3	Beetroot	Insecticide	Imidacloprid	Aphid and thrips	01-Dec-15	31-Jul-25	Hort Innovation	All states and territories except VIC
*PER14722 Version 3	Cucumber, squash and zucchini, and potato (field use only)	Miticide/ Insecticide	Abamectin	Tomato red spider mite (*Tetranychus evansi*)	17-Feb-15	31-Jul-25	Hort Innovation	All states and territories except VIC
PER83765 Version 2	Spinach and silverbeet	Fungicide	Fludioxinil + Metalaxyl-M	Damping off caused by *Rhizoctonia solani,* or *Phytophthora* spp.	21-Aug-17	31-Jul-25	Hort Innovation	All states and territories except VIC
PER82456 Version 2	Snow peas, sugar snap peas, field grown capsicums, chillies and paprika	Fungicide	Mancozeb + Metalaxyl-M	Downy mildew	27-Jun-17	31-Jul-25	Hort Innovation	All states and territories except VIC
PER80954 Version 3	Snow peas and sugar snap peas	Insecticide	Methoxyfenozide	Native budworm (*Helicoverpa punctigera*); tomato grub/corn earworm (*Helicoverpa armigera*); cluster caterpillar (*Spodoptera litura*)	01-Oct-15	31-Jul-25	Hort Innovation	All states and territories
PER80975 Version 3	Parsley (field and protected)	Insecticide	Lambda-cyhalothrin	Redlegged earth mite, Rutherglen bug, grey cluster bug, onion thrips, plague thrips and looper	11-Oct-15	31-Jul-25	Hort Innovation	All states and territories except VIC
PER12716 Version 3	Asian root vegetables	Insecticide	Imidacloprid	Greenhouse whitefly, green peach aphid and suppression of plague thrips	12-Apr-15	31-Jul-25	Hort Innovation	All states and territories except VIC

Please note:

Permits are routinely approved and extended. For more up-to-date new permits and permit extensions, please refer to the AUSVEG Weekly Update or the APVMA website.

All efforts have been made to provide the most current, complete and accurate information on these permits, however we recommend that you confirm the details of these permits at the following APVMA website: portal.apvma.gov.au/permits.

*PER14722 Version 2 also included capsicum, chilli, paprika, eggplant, sweet corn, snow pea, sugar snap pea and tomato. These crops are now covered on various Abamectin Registered Labels and are therefore not included in Version 3 of this permit.

This communication has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government.

Hort Innovation Strategic levy investment | VEGETABLE FUND

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AUSVEG SA

AUSVEG SA has recently revised a campaign to encourage local government to come to the table with seed funding for flood mitigation works along the Gawler River.

We have conducted significant media activities and advocacy on this issue in recent months, and are pushing for local government to prepare seed funding and project costings for matching state and federal funding. This project is critical as it is necessary to protect the heart of the Northern Adelaide Plains food bowl and ongoing uncertainty is hampering investment for local growers.

Meanwhile, AUSVEG SA continues to advocate on behalf of SA growers for initiatives to support our industry to access workers in light of worker shortages caused by COVID-19. We have collected some concerning data showing the likelihood of worker shortages in the state in November and December, and working with the state government and national horticulture groups to develop policy responses. We are keen to hear about grower concerns so we can work to address these with decision makers.

On the local front, AUSVEG SA welcomes new Minister the Hon. David Basham MP to the agriculture portfolio. Minister Basham replaces the Hon Tim Whetstone MP, and we hope he continues the strong work established by Minister Whetstone in supporting horticulture in our state.

Minister Basham has strong credentials in agricultural advocacy. As a dairy farmer, he has been involved in industry advocacy in the dairy sector. We look forward to seeing the current government continue its work to deliver important initiatives – such as the AgTech agenda – over the coming years.

Tim Withers
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Interim State Manager

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VGA trading as AUSVEG VIC

AUSVEG VIC

The second wave of COVID-19 in Victoria has affected growers to varying degrees. Many of those are growers who supply the food services industry, or who have farms interstate and have not been allowed across the border. AUSVEG VIC acknowledges the frustration this has caused these growers, and is working with AUSVEG at a national level to engage the respective state governments where this has become an issue.

AUSVEG VIC has turned its eyes to see how it can deliver its projects and adapt to the COVID-19 pandemic at-hand. The Schools on Farms program – undertaken in partnership with Boomaroo Nurseries and the Stephanie Alexander Kitchen Garden Foundation – has gained momentum since its pilot in late 2019, and continues to build in 2020.

AUSVEG VIC President Paul Gazzola acknowledges that there are many initiatives in Victoria that aim to achieve the same goals on engaging Victorian students: educating them on agriculture and where their food comes from; and possible career opportunities. AUSVEG VIC believes that through collaborating with other like-minded associations, these goals will become more attainable and will help drive the education system to incorporate agriculture into the school curriculum.

An example of this collaboration is AUSVEG VIC's partnership with the Port Phillip and Westernport Catchment Management Authority (PPWCMA). AUSVEG VIC – through the Schools on Farms program – has partnered with PPWCMA to deliver Farms2Schools, a six-month project that will connect farms and schools through educational activities. This project is supported by the Victorian Government.

With many face-to-face school excursions postponed due to COVID-19, AUSVEG VIC is working in conjunction with PPWCMA and with farmers and schools to deliver live Zoom incursions. PPWCMA is also contracting videographers to create Victorian agriculture videos for use by primary and secondary schools.

The agriculture videos plan to deliver a virtual farm tour experience covering a range of topics, including:

1. Paddock to plate.
2. Farm sustainability.
3. Career pathways in agriculture.
4. Indigenous agriculture.

For further information or to get involved in the program, please visit the Schools on Farms page via the AUSVEG VIC website or contact Tim Withers.

Tasmanian Farmers and Graziers Association

Nathan Richardson
Tasmanian Farmers and
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Vegetable Council Chair

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What a year 2020 is turning out to be. The past few months have screamed by and in the wake of it, we are left with rutted paddocks and bogged harvesters. With a wet autumn and early winter, it has tested the limits of operators and machines. Then throw in COVID-19. We are a long way off from accepting that agriculture will be the powerhouse that brings us out of the depth of this pandemic. It is fair to say that we are in a situation where the only thing we can predict is that everything is completely unpredictable. The way our markets are moving in both directions across so many commodities proves that until this pandemic has a master, the uncertainty will continue.

When the chips are down, it brings our leaders to the fore. Both Tasmanian Farmers and Graziers Association Potato Committees have had huge challenges this harvest, and I really hope that the work that goes on for the benefit of all growers is recognised.

To Trevor Hall and Beau Gooch and their committee members, I – on behalf of all potato growers –thank you. The issues that are being dealt with over the past few months has been incredible. My role as Chair that I strive to maintain is one of complete support for all commodity groups and their chairs. Without such a willingness to represent, our members would be subject to a vastly different economic landscape. Many members have given their time for our industry and it is never a bad time to politely suggest that new blood is always welcome, so I urge everyone to consider a representative role on one of our commodity groups.

The COVID-19 disruption will end one day, and how we all get back to work on the next day will prove whether we have made valuable use of our time. Quality will always sell, alongside reliable supply. As an industry that has cried out for years to be noticed for the worth it brings to our country, it is only now that the masses realise how important local food and manufacturing is to Australia in terms of employment and a secure self-reliance.

NSW Farmers Association

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In the last NSW Farmers update, I hoped that we'd be finding our way through a post-COVID world by this time. While we're starting to get used to these new ways of working, it's apparent that the world won't be going 'back to normal' any time soon.

However, when I visited our horticulture committee chair Guy Gaeta at his farm in Orange in late-July, the world didn't seem that different. Sheltered from the COVID-chaos of the city, our horticulture producers are getting on with the job. We're still working on key areas of concern for our growers – whether it's access to water, managing flying foxes, dealing with planning and council issues, or enforcing the Horticulture Code of Conduct.

Labour issues continue to be a challenge for growers. Early in the pandemic, we needed to secure inter-regional movements to enable workers in capital cities to move to regional areas. Now we're facing both state and national border closures, affecting the ability of workers to move safely around different properties within a defined region, and stemming the regular flow of working holiday makers prior to critical harvest times. Commentary around employing local labour has been unhelpful at times. Most growers have engaged locals at some point, and many continue to have great local staff. But we know that we can't expect job seekers from cities to move away from their support networks, often into shared accommodation, for uncertain work in the regions – particularly when the public health orders are changing on a weekly basis.

NSW Farmers and the National Farmers' Federation have been working with the Backpacker and Youth Tourism Advisory Panel to develop a pilot program that would allow working holiday makers into the country to fill these gaps.

The pandemic has also affected the way we're doing business in our committee. Many of our members are becoming experts at meeting online, and our Executive Council held a fully online meeting, debating and voting on policy positions – no small feat. This year, our Horticulture Annual General Meeting will be moved online as well, allowing our members to tune in from wherever they are in the state.

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Campaigning is about to begin in earnest ahead of the Queensland election in October.

Ahead of every election, wise pundits will observe that there's a lot at stake. It's an overused observation. Not every election is equally important.

But you'd have to agree that it applies more than ever this time around. There's plenty at stake.

We're in the midst of a global pandemic. One in 10 Australian workers are expected to be unemployed by Christmas. It's a pretty grim outlook all round.

One bright spot for the Queensland economy has been the performance of the agriculture industries. Regardless of what's going on, people have still got to eat; and horticulture is going to prove the cornerstone of an agriculture-led recovery of the Queensland economy.

We are the second largest and fastest growing agricultural sector. We are especially efficient at turning energy, water and sunlight into nutritious produce, jobs and increasing regional wealth.

Despite all the noise being created by COVID-19, from now on political parties of all persuasions will increasingly be attempting to cut through and reach voters with their various commitments.

Our advice to those aspiring to form the next Queensland Government is that letting the handbrake off horticulture is going to be essential for recovering the Queensland economy, and for winning the next election.

There is a direct relationship between lowering the price of our inputs, like power and water – over which the Queensland Government enjoys a near monopoly – and the amount of produce we can deliver, the number of Queenslanders we can employ, and the local communities we can support.

For too long, governments have treated their pricing of water and electricity as means of indirect taxation. Their relationship with industry has been parasitic, not symbiotic.

No government has ever taxed its way out of a recession. The answer for Queensland will be growth, and in particular, letting the handbrake off horticulture.

vegetablesWA

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Communicating with growers is vitally important now more than ever due to the pandemic, and finding a way to deliver key messaging is something that vegetablesWA is taking very seriously. Recently the team have recorded two webinars covering labour issues and food safety.

Industry bodies within horticulture are seriously concerned that labour sources are going to become an issue. With even stricter regimes being put in place and restricted movements across our borders due to COVID-19, we feel this discussion is critically important to ensure production and business continuity. Our Labour Scheme Facilitator, Melissa Denning, was joined by growers and industry to have a candid conversation about the current situation, discuss the issues and look for workable solutions. We had around 45 people jump on this webinar and ask some really valuable questions. If you're a grower concerned about getting workers, there are resources available – such as the Studium website – that are free and available to connect you with the workers you need.

The other webinar we delivered looked at melon safety. Any grower that washes and packs fresh produce for market is recommended to take a look at this webinar on the vegetablesWA YouTube channel. We had growers from all over Australia, and as far as New Zealand, contribute to this webinar and the feedback has been extremely positive.

Truyen and Melissa travelled to Geraldton last month where they hosted a labour scheme workshop and got some valuable one-on-one face time with growers. Sam, Amber and Karen visited Mundaring Christian College to talk about careers in horticulture and inspire the next generation to explore the huge variety of options we have on offer in the industry. Manus travelled down to Manjimup to speak with growers about getting their produce to export.

vegetablesWA has been granted funding to assist its members by providing them with business extension, human resources and industrial relations advice and information. We have appointed Stephen Farrell to this position and are excited to offer our members support with contracts and policies in the near future.

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NT Farmers Association

Once again, the Northern Territory has experienced below average annual rainfall during our 2019-2020 wet season. Combined with a record number of higher than average daily temperatures over 40°C, the horticulture and agriculture sectors have faced a very different lead into the dry season for 2020.

The Katherine/Tindal area has been placed on a water allocation plan for this growing season (until May 2021). NT Farmers played an important role in assisting growers during this process. Working with the Department Natural Environment and Resources (DNER), we wanted to ensure operations could run as smoothly as possible, given these interesting climatic conditions and future uncertainties. Only a handful of growers were disappointed with the allocations granted, with many taking a proactive position on the changes required to their current on-farm management practices to achieve adequate production outputs this season.

The arrival of the fall armyworm (*Spodoptera frugiperda*) is another challenge that is being faced at the beginning of the Top End's main vegetable growing season, with detections across the Darwin, Douglas Daly and Katherine regions. Extensive trapping and monitoring has been occurring since its arrival in far-north Queensland, and to date the impact on crops in the NT has been minimal. Sweet corn appears to be their preferred diet and corn plantings have been impacted across the three regions. The APVMA promptly released a range of minor use permits to assist growers in managing fall armyworm. A sentinel trial has been set up through the DPIR at the Coastal Plains Research Farm, looking at potential host crops and the preferences the fall armyworm may have as its dietary source. These planting included melon, sweet corn, chilli, okra and cotton (non-GMO and Bollgard III varieties). These will continue to be monitored and data collected throughout the coming months.

NT Farmers has recently provided recommendations on what is needed to assist the NT economy following the COVID-19 pandemic. These focused on key opportunities and policy settings that will influence the Top End's vegetable industry, and help to navigate the challenges that lie ahead. For example, the existing workforce labour shortfalls ahead of the upcoming harvest.

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