vegetables australia

| Spring - 2021

COVER STORY | ANDREW AND DAVID MOON: 2021 SYNGENTA GROWER OF THE YEAR

HORT CONNECTIONS 2021 | A TREMENDOUS SUCCESS

SPECIAL INVESTIGATION | INSPECTING THE FRONT LINE OF AUSTRALIA'S BORDER SECURITY

KUBOTA IMPLEMENTS

IT'S WHAT'S BEHIND YOU, THAT GETS YOU AHEAD

When you're looking for an Implement you can rely on, look no further than the Kubota Implement range

1.9% PA FINANCE UP TO 60 MONTHS*

ACROSS THE IMPLEMENTS RANGE

VP1600F VEGETABLE PLANTER SOWING OINIONS

Supporting your growth for all seasons

The Kubota Implement range offers the most advanced machinery to support the needs of Australian farmers.

Kubota are continually developing their range for greater efficiency and performance, with the highest standards of engineering.

Featuring an extensive range of vegetable planters, precision planters, fertiliser spreaders, ploughs, cultivators, seed drills and more. There's support for your farm no matter the size or the season.

When you're looking for an Implement you can rely on, look no further than the Kubota Implement range, we're right behind you.

Ploughs

Precision Planters

Tine Cultivators

Power Harrows

Spreaders

Compact Disc

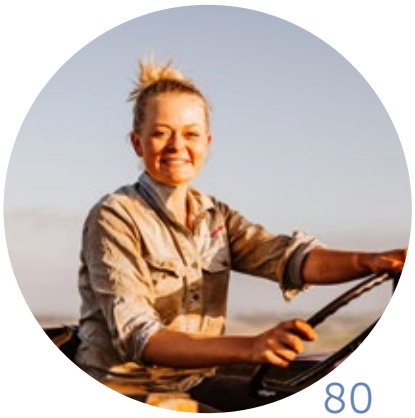
KUBOTA.COM.AU

For Earth, For Life
Kubota

*Offer is available for business borrowers only. This 1.9%p.a. finance rate is only available with a minimum 20% deposit, terms 13-60 months and minimum financed amount of $4,000. Terms, conditions, fees, charges and credit criteria apply. Different term and different deposit may result in a different rate. Credit provided by Kubota Australia Pty Ltd ABN 72005300621. This finance offer is available until 31/10/2021 and applies to new Kubota Implements.

10

48



80

Contents

Regulars

Hort Connections

Industry news

Features

Research and Development: VegNET

Research and Development

Bill Bulmer
AUSVEG CHAIR

Michael Coote
AUSVEG CEO

Shaun Lindhe
COMMUNICATIONS MANAGER

Michelle De'Lisle
WRITER/EDITOR

CONTRIBUTORS
John Baker
Casey Brown
Simone Cameron
Tyson Cattle
Bonnie Dawson
Bree Grima
Growcom – Fair Farms team
Zara Hall
Jil Hogan
Shaun Hood
Wayne Ingram
Integrated weed management team
Sylvia Jelinek
Dimi Kyriakou
Ossie Lang
Yanyu Liang
Sarah Limpus
Zali Mahony
Scott Mathew
Alan Nankivell
Soil Wealth and ICP team
Ian Thomas
Sam Turner

EDITORIAL ENQUIRIES: AUSVEG
Phone: 03 9882 0277
communications@ausveg.com.au

PRINT
RA Printing

GRAPHIC DESIGN
Stray Orbit

COVER PHOTOGRAPHY
Dust to Dawn Photography

HORT CONNECTIONS PHOTOGRAPHY
Andrew Beveridge

ADVERTISING
Tim Withers
AUSVEG Account Executive – Advertising
Phone: 03 9070 0704
tim.withers@ausveg.com.au

infoVeg ONLINE · RADIO · TV
ausveg.com.au/infoveg

@ausveg #infoveg

facebook.com/AUSVEG

@ausveg #ausveg

Search "AUSVEG"

The project *National Vegetable Industry Communications Program* (VG18000) is a strategic levy investment under the Hort Innovation Vegetable Fund. Communication of research and development projects has been funded by Hort Innovation using the vegetable research and development levy and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture. *Vegetables Australia* and *Vegenotes* are produced by AUSVEG Ltd and are free for all national vegetable levy payers.

ISSN 1834-2493

Audited Media Association of Australia cab

Vegetables Australia is the most widely distributed magazine in Australian horticulture.

AUSVEG

Hort Innovation

FSC www.fsc.org MIX Paper from responsible sources FSC® C007281

Editorial

Tumultuous and uncertain times continue for all Australians. At the time of writing, New South Wales, Victoria and Canberra are in hard lockdown. This means that over 15 million people are confined to their homes only able to leave for essential reasons, which can take a toll on overall health and wellbeing.

Thanks to the hard work of growers and the essential nature of the industry, vegetable production can continue in these regions and right around the country despite these challenges. Growers can continue to what they do best: growing fresh, clean produce for all Australians, which can be accessed at all major supermarkets, fresh produce markets and greengrocers.

With so many people at home, vegetable preparation and consumption has never been so crucial. The past 18 months have shown that consumers are exploring the kitchen more and are open to trying new recipes. At Hort Connections 2021, media personality and cookbook author Alice Zaslavsky outlined how industry can connect with consumers and tell their story (turn to page 14 to read more).

Children are also learning from home in two of Australia's most populous states. With just six per cent of Australian children eating the recommended daily intake of vegetables, this could be a time to get them in the kitchen and learn about different vegetables as well as helping to prepare veggies or read recipes to Mum or Dad.

It is vital that adults and children remain healthy during these uncertain times. As Perfection Fresh CEO Michael Simonetta tells *Vegetables Australia*, fresh produce and healthy food play a critical role in contributing to our physical and mental wellbeing.

He adds that inspiring all Australians to connect with each other through healthy food – whether in-person or remotely – is relevant now more than ever.

Perfection Fresh is assisting with this through its involvement in the #Cook2Connect initiative, which is encouraging Australians to 'share a plate with a mate' and at the same time, donate to food relief charity OzHarvest (see page 87 for more).

We can all play our part in keeping healthy and connected, but these are uncertain times. There are a number of resources available to assist those who may be struggling with their mental health.

In the first instance, it is always best to talk to your GP – even in a pandemic. There is also telehealth available, as well as a range of online services available that can provide Australians with immediate assistance, information and resources.

Details of these are available on the AUSVEG website: ausveg.com.au/mental-health-industry/resources-2.

Message from the CEO

It is a great privilege to address you as AUSVEG CEO. While I have already worked in this industry for many years, I am looking forward to the task of advocating strongly for our growers across all levels of industry and government on critical issues.

I have worked with many vegetable growers through my previous role as National Manager – Export Development, where I led AUSVEG's international trade agenda, export development activities and trade team to build capabilities in exporting businesses, helped advocate for better international market access for our industry and assisted AUSVEG in advancing the causes of vegetable growers.

As the peak industry body for the vegetable industry, AUSVEG preforms an important function for growers. AUSVEG is run *by growers for growers*, and has close ties with regional- and state-based grower groups, government ministers, advisors and departmental officials at all levels.

One of my priorities for the next 6-12 months will be to work with the AUSVEG Board, growers and other stakeholders to review our strategic direction in light of the significant changes that COVID has forced on all of our businesses and our daily lives.

Part of this strategic review will be to focus on our core functions, such as advocacy, biosecurity, export development, extension and communications, and boost our capacity in these areas to lift our output.

We also need to improve our engagement back to industry. Engagement in a two-way street – we need to tell growers what we are doing and how this will help with their businesses and the industry, but we also need to listen to growers and others more actively in the industry and the wider supply chain so that we are aware of the issues that are important to vegetable growers.

Part of this focus on engagement will be to seek guidance and feedback from growers and our state member organisations about our advocacy agenda to develop and refine our policy positions on important industry issues ahead of the next Federal Election. This is a critical piece of work to ensure that the lived experiences of growers from all across the country informs our election platform.

This election will likely be one of the most important for our industry in recent times to ensure that the vegetable industry – and the wider horticulture sector – can emerge from the pandemic stronger, more competitive and more productive for years to come.

Another core function of the organisation is its role in overseeing the vegetable and fresh potato levies to ensure that the investment of these levies, administered by Hort Innovation, meets the expectations of levy payers.

We know this is a key issue for many growers, so we will ensure that we hold Hort Innovation to account of its investments. We will also continue to work through our communications program and with the industry's extension network to promote the important research outcomes from Hort Innovation's levy investment program so growers can see the benefits of their levy expenditure.

I would like to thank our outgoing CEO James Whiteside. James and I had a close working relationship, and I look forward to building on his good work over many years to help our vegetable growers.

I look forward to working with our broad network of growers, supply chain partners and contacts throughout government to advance the causes of growers in the years ahead.

Michael Coote
CEO
AUSVEG

HORTECH

HORTICULTURE TECHNOLOGY

HORTECH VEGETABLE EQUIPMENT

Hortech company designs and produces machinery for soil preparation, transplanting and harvest of vegetables.

Hortech Harvesters are perfect for head vegetables, leafy products and for processing. 18 Models to choose from • Self Propelled - Wheels or Tracks • 3 Point Linkage • Different Cutting Systems available • Shaker Cleaning System • Green House Electric Models • Bulk, Crates or Bins.

VR

VIN ROWE

FARM MACHINERY

3 Endeavour Street WARRAGUL. VIC. 3820 WWW.VINROWE.COM.AU

Australian Importer and Distributor for HORTECH

FOR FURTHER INFORMATION CONTACT WAYNE MILLS 0417 945584

Hort Connections 2021 – Celebrating the International Year of Fruits and Vegetables

Despite the ongoing disruption from COVID-19 and the snap lockdown preventing Victorians from travelling to the event, over 2,200 delegates from all sectors of the horticulture industry descended on the Brisbane Convention and Exhibition Centre from 7-9 June to 'Celebrate the International Year of Fruits and Vegetables'. There were hundreds more who tuned in and streamed the speaker sessions.

Hort Connections encompasses the vegetable, fruit, nut, cut floral and nursery sectors. This year, more than 60 event sponsors and industry organisations partnered to provide added value to delegates and allow them to access the expertise and services of a range of industry members in-person and online.

The three-day event was the premier opportunity for supply chain members, growers and industry stakeholders in the fresh produce and floral industry to see the latest in technology and innovation, hear from industry experts, meet leading local and global agribusinesses and network at the most highly anticipated social events on the industry's calendar.

Major sponsors of Hort Connections 2021 included Hort Innovation (Principal Convention Partner), Syngenta, Coles and the Queensland Department of Agriculture.

Trade Show

The snap lockdown in Victoria did little to dent the impact of the Hort Connections 2021 Trade Show, which was a major highlight of the conference and presented an unparalleled opportunity to network with the leading supply chain partners in Australian horticulture.

It featured around 190 industry partners from across every sector of the industry and provided delegates with the chance to look at the latest trends, technologies and services to give their businesses an edge in both productivity and profitability.

The trade show was sponsored by Australia's Fresh Produce Markets. During the event, many growers and industry members were able to forge new partnerships with a range of leading agribusinesses and reconnect with friends, colleagues and supply chain partners to celebrate the achievements of the horticulture industry through what was the most difficult year for many businesses and communities.

The Hort Connections 2021 Trade Show also featured a dedicated networking hour, with the Trade Show Happy Hour sponsored by Nufarm taking place at the close of Tuesday 8 June, which allowed delegates to mingle with exhibitors around the entire trade show.

Industry events

A number of industry events that catered to growers and supply chain participants were held in conjunction with Hort Connections 2021:

- Lockyer Valley Growers Expo.
- Avo Connections.
- Potato Industry Networking Event.
- Queensland Horticulture Export Congress.

Networking opportunities

Throughout the conference, networking events were held to connect growers with agribusinesses, researchers and representatives from all areas of the supply chain, transport and retail sectors, including the Hort Connections Gala Dinner, multiple off-site and on-site events held by Hort Connections sponsors and a variety of other events that coincided with the conference.

Gala Dinner

The capstone event of Hort Connections 2021 was the Gala Dinner, where industry members from across the supply chain gathered to celebrate the achievements of the best and brightest in the Australian horticulture industry. Queensland vegetable growers Andrew and David Moon won the Syngenta Grower of the Year award, while Fresh Markets Australia won the 2021 PMA-Produce Plus Marketer of the Year award for its 'A Better Choice!' – Shop & Win campaign.

Annual Vegetable Industry Seminar, which covered:

- Making horticulture more attractive for prospective workers and students.
- Advanced crop protection.
- Export and trade.
- Fruit and vegetable marketing.
- Increasing children's consumption of vegetables.

Supply Chain and Consumer speaker sessions, which covered a number of topics, such as:

- Overview of the consumer market for fruits and vegetables, and state of the industry.
- Market access.
- Fresh produce safety.
- Data management.
- Business innovation.

Plenary Sessions featuring leading thought-leaders and industry figures:

- Agriculture Minister David Littleproud.
- AgTech leader Jack Milbank.
- Author Alice Zaslavsky.
- Food Frontier CEO Thomas King.
- Athlete and Peak Performance Coach Adele Spurgin.
- Consumer Trends Specialist Lewis Muscat.

Keep brassica vegetable pests pinned down.

BAYER

MOVENTO®

Diamondback moth
(*Plutella xylostella*)

Stop the pests wherever they're hiding in your brassica vegetables, with the two-way systemic action of Movento®:

- Protects the whole plant
- The only registered Group 23 insecticide
- Low impact to most beneficial species, when used as directed

With long-lasting protection, Movento can be effectively used as part of your integrated pest management program.

To learn more and download the Movento brassicas crop guide, visit crop.bayer.com.au/movento or talk to your local Bayer Crop Science representative.

Green peach aphid
(*Myzus persicae*)

Grey cabbage aphid
(*Brevicoryne brassicae*)

Silverleaf whitefly
(*Bemisia tabaci* biotype B)

pma

AUSVEG

HORT CONNECTIONS

7-9 June 2021
Brisbane Convention Centre

Celebrating the international year of fruits and vegetables

Andrew and David Moon

Syngenta Grower of the Year

L-R: Paul Luxton, Syngenta Australia – New Zealand Managing Director, and Andrew Moon

Xavier Toohey

Corteva Agriscience Young Grower of the Year

Xavier Toohey, image courtesy of Corteva Agriscience

Catherine Velisha

Boomaroo Nurseries Women in Horticulture award

Catherine Velisha

Steve Moffatt

Hort Innovation Exporter of the Year

L-R Julie Bird, Hort Innovation Chair, Steven Moffatt, and Mitchell Moffatt

National Awards for Excellence recipients honoured

The Hort Connections 2021 National Awards for Excellence Gala Dinner, sponsored by OneHarvest, celebrated the outstanding achievements and contributions made to the Australian horticulture industry by growers, marketers, researchers and supply chain members.

Dr Jenny Ekman

Bayer Researcher of the Year

L-R Scott Ward, Bayer National Sales Manager, Horticulture, and Dr Jenny Ekman

East Gippsland Vegetable Innovation Days

Visy Industry Impact award

L-R Bonnie Dawson, Daniel Hammond, Noel Jansz, Stuart Grigg and Andrew Bulmer. Absent: Jody O'Brien, Kate Grigg. Image courtesy of Bonnie Dawson.

Andrew Smith

E. E. Muir & Sons Community Stewardship award

L-R Troy Muller, E. E. Muir & Sons Regional Manager – South-East Queensland and Andrew Smith

Mark and Darren Todaro

Butler Market Gardens Environmental award

L-R Belinda Adams, AUSVEG Deputy Chair (on behalf of Butler Market Gardens), Tim Withers, AUSVEG VIC Executive Officer (accepting the award on behalf of Todaro Farms) →

National Awards for Excellence recipients (continued)

Fresh Markets Australia – 'A Better Choice!' Shop&Win campaign

PMA A-NZ and Produce Plus Magazine MOYA Marketer of the Year award

L-R: Verena Cunningham, General Manager SeekaFresh & Strategy, and Hamish Montague, FMA Deputy Chair

The Yield

PMA A-NZ Tech Innovation award 2021

L-R: Ian Cass, UPL Australia Marketing & Business Development Manager, and Ros Harvey, The Yield Founder and Managing Director

Peter Tighe

FMA Meritorious Service award

L-R: Peter Tighe, and Hamish Montague, FMA Deputy Chair

Claudia Etherington

FMA Col Johnson Young Achiever's award

Trish Skinner (accepting the award on behalf of Claudia Etherington)

JOHN DEERE

☑ MOWING BETWEEN TREES.

☑ PULLING 6 BINS.

☒ FINDING RECEIPTS FOR YOUR ACCOUNTANT.

5 Series makes *almost* any job easy.

5E

5M

5R

0% P.A FINANCE* AVAILABLE

30% DEPOSIT

48 MONTHS

Find out which 5 Series Tractor will tackle all your jobs at JohnDeere.com.au/5SeriesTractors

*Conditions apply. John Deere Financial Limited. Approved commercial applicants only. Based on 30% deposit, GST back and 48 month term. Fees and charges apply. Expires on 31st December, 2021. Other terms and rates are available.

TRACTA64003_5 SERIES_AUSVEG


Alice Zaslavsky.

Putting veg first: Consumption in the spotlight

Consumer sentiment was at the heart of Alice Zaslavsky's presentation at Hort Connections 2021, with the discussion ranging from what consumes the consumer and how the industry can help to increase vegetable consumption by understanding their needs.

Cookbook author and broadcaster, Alice Zaslavsky, didn't let the Victorian lockdown and subsequent border restrictions stop her from appearing at Hort Connections 2021.

Alice pre-recorded her presentation for the Plenary Speaker Sessions, which were sponsored by Hort Innovation and held on Wednesday 9 June at the Brisbane Convention and Exhibition Centre. Throughout the presentation – entitled *What consumes the consumer and how to help boost consumption and connection with the industry* – Alice drew her experiences as a *MasterChef* contestant, broadcaster, cookbook author and project lead of 'Phenomenom', to educate the vegetable industry about engaging with everyday Australians.

A strategic levy investment under the Hort Innovation Mushroom, Onion and Vegetable Funds, Phenomenom is a digital toolkit for Australian teachers that aims to help engage children with vegetables and cultivate their curiosity around fresh food.

Alice's connection with consumers spans 10 years. She outlined the main issues associated with veg consumption: time, skills and value; that is, the taste expected of vegetables and their cost.

She spoke about the negative narrative around vegetables, and children being forced to eat vegetables – "a hangover from an earlier time," as she described it.

However, it has noted that vegetables have gained popularity during the COVID-19 pandemic.

"What's exciting is my message hasn't changed. We are at the precipice of a paradigm shift," Alice said.

"What we're seeing through the pandemic is an acceleration of all of those things that consumer insight experts have been speaking about – that the appetite for vegetables is changing."

Veg possibilities

Alice pointed out that the surge in veg popularity has been reflected in the sales of her book, which has been a "beneficiary of that change." Released in November 2020, *In Praise of Veg: A Modern Kitchen Companion*, has been reprinted five times and is on-track to sell 100,000 copies worldwide by the end of this year.

Based on the data and consumer insight information that has been recorded, Alice said it is time to reach out to the audience.

"Now is the time for grower and communicators to connect with the consumer and push them towards the changes that they're ready to make," she declared.

Alice outlined ways to communicate with the audience, including telling the story about how vegetables are being repurposed to minimise food waste is an option; for example, Fresh Select is producing vegetable powders that can be used in drinks.

There are also opportunities around educating consumers: how can we help them to use every part of a foreign veg? Sending that sustainability message is key, and Alice again pointed to the pandemic and how it has made people recognise that they are part of an "an edible ecosystem."

"If they don't support their local growers, their Australian industry, we might not have a sustainable edible ecosystem in the generations to come. So, now is the time to harness that national pride in what is it is that we grow," she said.

Consumer connection

Social media plays a big part in how businesses can connect with their customers, and Alice explained that they should have someone who is the voice of the business – an employee to monitor social media channels and tailor content to suit their target audience. For example, a business might use Facebook to connect with older consumers but then switch to Instagram and/or TikTok to engage with the younger generation. She pointed out that the content should be authentic, and businesses can create this by sharing hacks and shortcuts with their produce or recipes.

"Think about adding value beyond slapping a face to your brand. Trust is paramount to what you're trying to build, particularly in this era of 'fake news'," Alice said.

Telling the grower story is also important and creates an emotional connection between producer and consumer.

"The story I desperately want you to tell is your story: YOU, the grower – how many generations have you been doing what you're doing? What makes you passionate about your produce? What gets you up in the morning to grow our food?," Alice asked.

"The more you can connect with us, the more that we can build a community of engaged consumers of your produce and the more sustainable our industry can be."

Find out more

Please visit aliceinframes.com. You can also connect with Alice on Facebook: facebook.com/aliceinframes; Instagram: @aliceinframes and Twitter: @aliceinframes.

Presentations from the 2021 Plenary Sessions are available to watch on the Hort Connections website: hortconnections.com.au/speaker-sessions-2021.


Mark Turner.

Overcoming food safety challenges across the fresh produce chain

Across two days, Hort Connections 2021 delegates were invited to participate in thought-provoking and interactive speaker sessions. One of these was hosted by Mark Turner – a Professor in Food Microbiology, University of Queensland – and he spoke about food safety, and how pathogen outbreaks can be minimised in pre- and post-harvest stages of vegetable production.

University of Queensland Professor Mark Turner took to the Hort Connections stage on Wednesday 9 June as part of the Supply Chain and Consumers Speaker Sessions, sponsored by Nielesen.

Mark is a Deputy Head of the School of Agriculture and Food Sciences at the University of Queensland and leads a research team in the area of food quality and safety. His session focused on fresh produce safety challenges and opportunities, and covered the pathogens that are present in the farm environment to controls that minimise the risks of these outbreaks occurring.

Salmonella and listeria monocytogenes are pathogens of concern when it comes to food safety. Mark discussed outbreaks that have occurred in the United States and Australia, and he pointed to new technologies that are being used to identify the strains and where they originated.

Whole Genome Sequencing (WGS) investigates the entire DNA sequence to link cases and identify outbreaks. It was successfully used in a recent outbreak of salmonella in red onions in the U.S.A., the largest salad outbreak in over a decade affecting more than 1,600 people. WGS was used to trace the pathogen back to an operation where it was found in water and sediment samples that had likely come from grazing sheep in adjacent land. There had been cross-contamination in the processing and handling of the product.

While outbreaks are not as prevalent in Australia, listeria – a foodborne illness caused by the bacteria Listeria monocytogenes – has higher mortality rates than salmonella. Deaths occur in 20-30 per cent of listeria cases. Therefore, it is important that there are controls right along the supply chain to minimise the risk of foodborne illnesses such as listeria.

Pre-harvest and post-harvest controls

Mark outlined what can be done in the field prior to harvest taking place. Treating and testing water, keeping livestock away from the crop to avoid faecal contamination, avoiding wildlife intrusion and using good equipment and personal hygiene were among controls to prevent pathogen infection. The focus then shifted to post-harvest and pathogen persistence in processing environments. Mark pointed out that cross-contamination can occur during produce washing and time-temperature abuse (when produce is kept at a temperature for a dangerous amount of time, which can lead to pathogen growth) can also take place.

New technology is a weapon in the food safety space. In addition to WGS, big data and the Internet of Things are being used to mitigate risk. Drone data is looking at animal intrusion, weather patterns are being recorded and there are new biological sanitation methods that are being trialled with positive results.

The bottom line

Mark said there is no way to achieving zero risk of contamination – pathogens are present in the farm environment and tracing back outbreak sources can be difficult. However, there is significant research being undertaken and lessons learned about food safety practices and fostering awareness of the risks results in better controls measures throughout the supply chain.

Keeping vegetables healthy and safe

In 2016, the University of Queensland and Hort Innovation partnered to develop new biocontrol strategies to inhibit bacterial pathogen growth in ready-to-eat vegetables. The project was developing, verifying and ultimately making available new biological control agents (new strains/blends of beneficial bacteria) to inhibit the growth of harmful bacteria on vegetables.

The two-year project used the friendly lactic acid bacteria 'Probisafe' discovered at the University of Queensland and commercialised by Uniquest. The team's main focus was investigating the consequences of adding these bacteria to bagged salad leaves to inhibit the growth of salmonella and listeria.

ProbiSafe – developing biocontrol agents to inhibit pathogen growth (VG16005) was a strategic levy investment under the Hort Innovation Vegetable Fund. More about this project can be found at: horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/vg16005.

Find out more

Presentations from the 2021 Supply Chain and Consumer Speaker Sessions are available to watch on the Hort Connections website: hortconnections.com.au/speaker-sessions-2021.

Dr David Cox.

VegKIT Speaker Session facilitator Claire Gardner addresses delegates.

How can we help kids learn to love veggies, and could this drive future demand?

Results from Australian health surveys show only six per cent of Australian children eat the recommended daily intake of vegetables. While it's not surprising that children aren't meeting their vegetable intake, the more concerning fact is low intake tends to carry right through to adulthood. Establishing healthy eating patterns for children is essential for forming good dietary habits that help prevent negative health outcomes. So, what can be done to ensure both healthier children and ongoing demand for vegetables?

A multi-million-dollar project is helping to address this significant underconsumption of vegetables by Australian children. *Tools and interventions for increasing children's vegetable knowledge – VegKIT* (VG16064) is a collaboration between CSIRO, Flinders University and Nutrition Australia that is delivering tools to increase children's vegetable intake. A strategic levy investment under the Hort Innovation Vegetable Fund, the five-year project engages a range of stakeholders with the goal of increasing Australian children's vegetable intake by half a serving, which would increase vegetable demand by 19,000 tonnes annually.

A panel of experts including nutritionist Tara Leong, Belinda Adams from Coastal Hydroponics, Healthy Kids Association Senior Project Manager Shadia Djakovic, Claire Gardner from Flinders University Caring Futures Institute, Perfection Fresh Australia Chief Commercial Officer John Simonetta and Astrid Poelman and David Cox from CSIRO, spoke to delegates at the Annual Vegetable Industry Seminar (AVIS) about how these initiatives are helping kids eat their vegetables.

Targeting kids where they are most

VegKIT initiatives are targeted at stakeholders where kids spend their most time – such as schools and childcare – with teaching resources, menu training, support to enable easier access to fresh produce. Shadia said a school setting is one way kids can learn to eat more veggies.

"The school canteen is a tricky place, and there are a lot of challenges. We know salty and sugary snacks may be to blame for the reduction in vegetable consumption. So, we need to make sure that meals and snacks are appealing and they also taste good, so kids keep going back for more," Shadia said.

Getting the marketing right

Another area that plays a big role in fostering a love of vegetables in children is through marketing. A great example of this is Perfection Fresh Australia's baby cucumber product, Qukes.

"We invest quite a substantial amount of money in marketing our key products, one of those is Qukes. Recently, we've joined with Soccer Australia and we're sponsoring the MiniRoos, which includes the Matildas," John said.

"We do some videos with the Matildas team, making cucumber snacks and salads. And the hits [on social media] have gone through the roof."

Belinda said colours, presentation, snacking size, and using characters are also proven ways to engage kids.

"A classic example are grape tomatoes. They're phenomenal as a substitute to lollies, and what parent doesn't want a child eating tomatoes or fruit?" she said.

Putting more veg on the plate

The other major source of vegetable information and supply is parents, and VegKIT resources can help to incorporate more vegetables at the dining room table. At the core of this is changing how adults teach children about veggies.

"We really do have to shift away from just getting parents to stand over the top of children and force them to eat carrots, because they contain vitamin E. That's it's very old-fashioned way of thinking," Tara said.

Recent research shows repeated exposure to a variety of vegetables teaches children to learn to like them. Astrid said a great approach is offering a small amount with every meal, whether kids eat them or not.

"We can also see that eating vegetables in combination with other kinds of foods and dishes that children like can help facilitate that transfer, and it actually also helps breed an acceptance for the vegetables themselves outside of that meal context," she said.

Find out more R&D

The VegKIT website now contains a suite of practical, evidence-based resources for food industry, health professionals, school and day care centres. These can be found at vegkit.com.au.

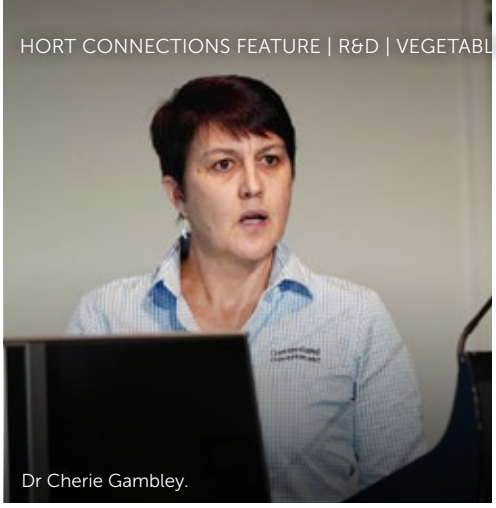
Presentations from the *2021 Annual Vegetable Industry Seminar* are available to watch on the Hort Connections website: hortconnections.com.au/speaker-sessions-2021.

Annual Vegetable Industry Seminar 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: VG20000

Hort Innovation Strategic levy investment | VEGETABLE FUND


Dr Cherie Gambley.


Session facilitator, Ian Layden from the Department of Agriculture and Fisheries, Queensland.


Dr Siva Subramaniam.

Advanced crop protection solutions for fall armyworm and serpentine leafminer

Outside of COVID-related factors, plant pests and diseases continue to be one of the biggest challenges for vegetable growers. Headlining these pest concerns are fall armyworm and serpentine leafminer, and they were on the agenda when the Department of Agriculture and Fisheries, Queensland panel presented its session entitled *Advanced Crop protection: Feeding people not pests*. Jil Hogan reports.

Fall armyworm

Fall armyworm (FAW) was first discovered in Australia in early 2020, and it quickly spread across northern and eastern Australia. FAW is highly invasive and destructive, with very fast generation time, and the adults can fly long distances and migrate quickly.

Research is currently underway to determine the most appropriate management approaches under Australian conditions. Speaking to delegates at Hort Connections 2021, senior entomologist Dr Ian Newton from the Department of Agriculture and Fisheries, Queensland (DAF, QLD) said one of the biggest challenges with FAW is the issue of resistance, with few non-chemical options available.

"It's coming from overseas and it's pre-packaged with resistance to most of the older chemicals. The newer chemicals are still effective on it and work quite well," Dr Newton said.

"But there are very few of those options, and if these chemicals get used too much then it will develop resistance to those as well. So, there are actually very few non-chemical alternative options available."

DAF, QLD is currently assessing the performance of a number of Nuclear Polyhedrosis Viruses (NPVs) under local conditions, and together with the Australian Centre for International Agricultural Research, is trialling a number of fungal-based biopesticides on FAW.

Serpentine leaf miner

Similar to FAW, serpentine leaf miner (SLM) was first discovered in Australia in early 2020. It was initially found in New South Wales before spreading to Queensland. The pest has a huge host range and can cause enormous amounts of damage, including leaf stippling, severe defoliation, reduction in crop quality and reduction of yield.

So far, certain insecticides have been used to manage the pest in Australia, but DAF, QLF panellist John Duff said these can have a serious impact on beneficial insects known to attack and keep SLM in check.

"Unfortunately, there's been a mad rush to look at chemical control. A lot of products that are currently being used are very disruptive," Mr Duff said.

"There are a lot of beneficial insects out there that can manage this pest. In Queensland, we've found up to 10 [beneficial insects]. So, there are a lot of natural enemies out there that can control this pest."

Using area wide management

An alternative method of managing the pests is through area wide management (AWM). Historically AWM has been applied to insect pests, but Dr Cherie Gambley said it can also work well for managing other diseases like viruses and phytoplasmas, as well as pests that can fly such as FAW and SLM.

Dr Gambley leads the project *Area Wide Management of Vegetable Diseases: viruses and bacteria* (VG16086), which is a strategic levy investment under the Hort Innovation Vegetable Fund. She said that by using a non-coordinated approach to AWM, chemicals can be used strategically to not drive insecticide resistance and protect post-genetics.

"For growers, [AWM gives] improved protection against your losses in crop failure. For the chemical companies, you're getting extended commercial life products. For the seed companies, you're also getting improved protection of those resistance genes, and an opportunity to continue the use of non-resistant varieties if the pests and diseases are managed well," Dr Gambley explained.

"For retailers, it's enhanced security products supply for both volume and consistent quality. And for consumers, it's reduced product price volatility through a supply and consistent quality product."

To successfully implement area wide management, Dr Gambley said monitoring is absolutely critical to capture baseline data, and measure if the approach is working or not.

Please turn to page 57 to read a full update on the area wide management project.

Find out more R&D

Presentations from the 2021 Annual Vegetable Industry Seminar are available to watch at hortconnections.com.au/speaker-sessions-2021.

2021 Annual Vegetable Industry Seminar 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: VG20000

Hort Innovation Strategic levy investment | VEGETABLE FUND

Export session panellists (from left to right) Trent De Paoli, Ryan McLeod, Ryan Densley, Michael Coote and Dianne Tipping.

Operating a business in a world without international travel

Vegetable exports were on the agenda at Hort Connections in 2021. A panel – including AUSVEG CEO Michael Coote – took to the stage at the Annual Vegetable Industry Seminar to discuss the challenges exporters face and identifying international trade opportunities, even during the current global pandemic.

The global pandemic has not only ground international travel to a near standstill, it has also had huge implications for international trade – particularly in Australia. For horticulture, this presents big challenges.

How do Australian producers move forward with exporting? Hort Innovation Head of International Trade, Brei Montgomery, and a panel of experts including Export Council of Australia Chair Dianne Tipping, AUSVEG CEO (formerly National Manager – Export Development) Michael Coote, Ryan Densley from Moffatt Fresh Produce, Trent De Paoli from De Paoli Orchards and Dicky Bill Australia Director Ryan McLeod led a discussion at Hort Connections 2021 about the past year, and where the horticulture export sector can find opportunities in the next 12 months.

"Relationships have never been more important and more challenging to maintain and develop in the increasingly virtual world," Brei told the audience.

"It will require creative outside the box thinking as to how the Australian export sector continues to hold market share in international markets and create new market opportunities with current and emerging partners. If we don't show up, our competitors will – and they are."

Despite the challenges of 2020, which included not only the pandemic but also bushfires and drought, Michael said the statistics were encouraging.

"In terms of vegetable exports last year, they were down about 6.6 per cent across the categories. We still managed to get about 216,000 tonnes of vegetables exported, worth around $263 million to over 50 countries. With all those disruptions of last year, these are really positive outcomes," he said.

The challenges

Given the perishable nature of vegetables, exporters are heavily reliant on air freight, so the lack of flights and huge increase in freight fees have been major challenges. The Australian Government's International Freight Assistance Mechanism (IFAM) package has helped to keep global air links open, but the panellists all agreed that while a return to consistent scheduling will be a significant help, air freight costs will probably never go back to their pre-pandemic levels.

"Prices are fluctuating and – depending on the market – can be two, three, or four times pre-COVID rates, and I certainly expect that in the short- to medium-term. And then the expectation is, long-term, that air freight rates will settle somewhere around 1.8 to 2.5 times pre-COVID rates, even when you do get back to some sort of normal and consistent schedule," Michael said.

Looking to the future

The only real growth opportunity for the vegetable industry in Australia is from international markets, and Michael said while there are a lot of challenges, there is also a lot of support from industry groups.

"The last thing I want to see is people giving up on it because it's too hard, too difficult or too costly. There's a huge growth opportunity there. But we need to see growth in this industry and that in the future that will come from export markets," he added.

Finding the opportunities

With so many unknowns, all panellists agreed their biggest focus currently is maintaining their existing customers, rather than expansion, and increasing communications channels with customers. Overall, Trent said he believes the pandemic has created more opportunities than ever.

"I think diversity creates opportunity, and I think the knocks on the door and the conversations that are happening now potentially didn't exist 12 months to two years ago," he said.

"I think that provides a greater opportunity more than anything; from a global perspective, it's short-term loss for long-term gain."

Find out more R&D

Presentations from the 2021 Annual Vegetable Industry Seminar are available to watch at hortconnections.com.au/speaker-sessions-2021.

2021 Annual Vegetable Industry Seminar 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: VG20000

Hort Innovation Strategic levy investment | VEGETABLE FUND

Focus on building strong category brands

Marketing fresh produce and individual commodities can be a tricky exercise. As Michelle De'Lisle reports, five marketing specialists took to the stage at the 2021 Annual Vegetable Industry Seminar to discuss the challenges and opportunities for growers to build a brand and connect with consumers. The *Annual Vegetable Industry Seminar* is a strategic levy investment under the Hort Innovation Vegetable Fund.

Marketing session panellists address delegates at the Annual Vegetable Industry Seminar.

Developing a strong, authentic brand that resonates with consumers was on the agenda at the Annual Vegetable Industry Seminar.

Joining Hort Innovation Group Marketing Manager, Matthew Dwyer, on-stage for this panel discussion was Evan Roberts from TWBA\Australia, Samantha Parker (Hort Innovation), Cori Hodge – (Fiftyfive5) and Ashleigh Carter (Atomic 212°). Each panellist had extensive marketing and brand experience, both within Australia and internationally.

The panel kicked off the session by outlining trends identified by media consumption surveys. Understanding when and how to deliver messages is key, as well as recognising dual consumption behaviour; that is, consumers who watch television while scrolling through social media. Connecting similar messages – but not repeating the same one – on different communication channels is recommended. For example, a brand's television advertisement would differ slightly to a social media post.

Samantha spoke about the Hort Innovation Marketing Levy and building strong brands within industries that have access to it such as mushrooms, apples and avocados. With category marketing, it is important to know how to use data insights and understand them. These insights are used to tell the story on those channels and influence what the consumer is searching for.

Establishing a brand

Cori outlined the challenges in category marketing, including attempting to identify where the growth is going to come from – understanding and prioritising who is at the heart of what the business trying to market. The panel discussed 'long-term brand building', and how it has worked for brands such as Carlton & United Breweries' Victoria Bitter (VB) lager. Evan's advice for long-term brand building included:

- Establish an insightful message and make it ownable.
- Be adaptable over the long-term.
- Deliver consistency, and don't be chaotic in your messaging.

Another example was the Australian Avocados' 'Our Green Gold' campaign. Evan worked on this campaign, and he gave delegates an insight into how it came about and why it has been successful to date.

Ashleigh discussed reaching consumers and bringing the message to life. She said that businesses had to connect the dots between being creative, having impact and consumer behaviour, and understand how to have effective reach.

The panel agreed that marketing wasn't all about repetition and long-term campaigns such as VB's – with the slogan 'For a hard-earned thirst' – work well because they stand for something. It plays on the consumer having worked really hard, and this is what they deserve.

Evan told delegates, 'If an idea has got legs, it can go anywhere.' Brand investment and awareness building can be done and over time, has a chance to be nuanced.

Grower perspective

There were questions from the audience around tapping into international markets, as well as marketing brands that are produce and managing grower expectations.

The panel explained to campaign internationally, there had to be an understanding of different roles of food – food as an occasion and food that is being eaten, and how international markets perceive Australia.

It was also concluded that grower input was critical for marketing campaigns – collaborating and bringing together the expertise of growers and market research companies helps to understand behaviour change with a view to grow demand.

Find out more R&D

Presentations from the 2021 *Annual Vegetable Industry Seminar* are available to watch at youtube.com.au/AUSVEG.

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

Project Number: VG20000

Hort Innovation Strategic levy investment | VEGETABLE FUND

Kerri-Ann Lamb.


Luciano Mesiti.


Classroom to Career session facilitator Professor Jim Pratley from Charles Sturt University.

Classroom to career: Encouraging more people into horticulture

The Annual Vegetable Industry Seminar (AVIS) at Hort Connections 2021 featured a panel discussion around horticultural education in the classroom, and how the knowledge gained could pave the way for a career in the sector. The AVIS was held on Wednesday 9 June at the Brisbane Convention Centre and attracted around 100 growers. Jil Hogan reports.

The *Sustaining Australia: Food and Grocery Manufacturing 2030* report by the Australian Food and Grocery Council found Australia's food and grocery sector could double by 2030. But the horticulture industry continues to face labour shortages. Therefore, it begs the questions: Where are all the future horticulture workers coming from, and how can we educate children about the sector?

Into the classroom

Education heavily starts in the classroom, and so too can learning about horticulture. Primary Industries Education Foundation Australia (PIEFA) is a not-for-profit organisation that collaborates with government, industry and education organisations to develop and promote teaching materials around agriculture and horticulture.

"The important messages about how wonderful our industries might be need to be crafted in such a way that we get the right message into the classroom, and that teachers don't have to work hard," PIEFA Chief Executive Officer Luciano Mesiti told the audience.

"We know from the research that we've done that 80 per cent of teachers go to Google and type in 'how to grow vegetables' and end up at a website in the United States, and they use a lot of that information in their classroom. So, we've got to move towards more targeted resourcing that is towards the Australian conditions and Australian experience."

PIEFA has developed two main digital resources, with content for every school year level. Prime Zone encompasses almost 700 teaching resources for teachers about food and fibre, including Prime Zone Academy, which is an eLearning portal with courses relevant to primary industries. Farmer Time is a virtual farm tour that allows teachers and students to connect with producers and ask questions and see what a career in food or fibre could look like.

"We know horticulture as an industry has come such a long way and it's vitally important we get those messages into the classroom," Mr Mesiti said.

From graduate to the workforce

To help bridge the gap between school and career, PIEFA has launched Career Harvest, a website for prospective students to discover career options, scholarships, and opportunities in horticulture.

Also helping to try and direct more people into the industry is agribusiness recruitment company Rimfire Resources. Since 2004, it has facilitated graduate program GradLink to spark more interest in horticulture.

Rimfire Resources engages host businesses and helps find them an appropriate graduate, who is engaged for a 10-week internship. The program can then also help fund the business to engage the grad in an ongoing position. Gemma Burger from Rimfire Resources said the vast majority of graduate participants hadn't previously considered horticulture as a career.

"[The program also gives] businesses an opportunity to take away some of that fear, and some of that risk [of] taking on someone who maybe doesn't have any industry experience," Ms Burger said.

A success story is Jack Tate. Jack is a graduate sales agronomist who completed the GradLink program and now works for Imtrade CropScience. He grew up in Melbourne and was studying podiatry at university, before switching to agricultural science and joining the grad program.

"I didn't really learn a great deal about horticulture at university. My first experience was when I was given the chance to move up to the Northern Rivers for a week and undertake a job trial with a macadamia agronomist. From there, I developed a bit of a passion," Jack said.

Find out more R&D

Presentations from the 2021 Annual Vegetable Industry Seminar are available to watch at hortconnections.com.au/speaker-sessions-2021.

2021 Annual Vegetable Industry Seminar 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: VG20000

Hort Innovation Strategic levy investment | VEGETABLE FUND

Knowledge grows

Improving productivity needn't cost the earth.

Quality nitrate fertilisers from Yara can optimise the yield and quality of crops without costing the earth. We've already reduced the carbon footprint of our nitrate fertiliser production by 40% by making our production plants and processes among the most energy-efficient in the world. Our ongoing development of 'green' ammonia technology and climate-smart agricultural practices means we're on track to reduce emissions by another 30% within a decade and carbon neutral by 2050. Contact Yara and find out how our integrated crop nutrition programs can deliver better agronomic, business and environmental outcomes for your farming business.

CARBON FOOTPRINT CO_2 GUARANTEE YARA

1800 684 266 au.sales@yara.com @yara_australia yara.com.au

Syngenta Grower of the Year award winners, David and Andrew Moon. Images courtesy of Dust to Dawn Photography.

Over the moon: Brothers share their secrets to long-term success

Moonrocks is a fifth-generation family farm that has been based in Queensland's St George region for well over 40 years. The business is owned and operated by Andrew Moon and his brother David, and the pair were honoured for their tireless contribution to the horticulture industry in June – receiving the Syngenta Grower of the Year award at the 2021 National Awards for Excellence.

Situated around 500 kilometres west of Brisbane is St George, a town whose economy is enriched by wheat, sheep, beef and cotton farming and, more recently, horticultural commodities including vegetables.

One of those vegetable growing operations that has successfully established itself in the region over the past four decades is Moonrocks. At the helm are brothers Andrew and David Moon – they took over the vegetable growing operation from their parents Jeff and Pam, who moved the family from the Lockyer Valley to St George in the late 1970s.

Moonrocks specialises predominantly in onions, garlic and pumpkins. In 2021, the operation established 'G'day Garlic', a direct-to-consumer value-added garlic line that offers customers a true paddock-to-plate experience. Processing and packaging of the products take place on-farm, which has supported the local community by creating jobs and contributed to business growth.

"This has given our business a new way to communicate with our consumers while leveraging off the demand for Australian grown and owned products," Andrew says.

Andrew credits a driven and experienced team to the business's success. He and David oversee the business operations together, but they also have their own areas that they focus on and drive.

"David manages the cropping – from planting through to harvest – working with our key staff to manage the variables that come into play in this part of the business, from soil health and weather changes, through to watering and harvest timeframes," Andrew explains.

"Once the crop is harvested, I manage the production and marketing side of the business, from key client communications and order/production management, through to seeking out and coordinating new sales channels and opportunities.

"Obviously being a family-owned and operated business means that there is plenty of crossover with our roles, and we rely on each other's opinions and experience every day. There is so much more to running the business than just the growing and marketing, and we have an incredible mix of key staff who work alongside us to keep the wheels turning."

Implementing change

Like any business that grows and evolves, Moonrocks has discovered new ways to operate throughout its journey.

"Moonrocks is a completely different business to what it was even 10 years ago, and I think that has been a key driver behind our growth. If we were still operating the same way we did back then, we certainly wouldn't be as efficient, structured and systematic as we are now," Andrew says.

"Farming isn't as simple as it was once upon a time – we're operating in a completely different business climate to that of even my father; let alone the generations before that. It comes with a lot more complexity, and Moonrocks has had to make plenty of changes over the years to adapt to this. Change is never easy, but it has certainly allowed us to continue to grow – I think if you resist change, you'll eventually be forced to play catch up."

Moonrocks is continually growing and implementing changes in its farming practices.

"There is always new technology and research that impact the decisions we make around growing," Andrew says.

"An industry heavyweight once taught me the importance of stepping outside of your business and looking at it 'from above' instead of spending too much time 'in' the business.

"David and I have spent a lot of time over the last 10 years working on structures, and future- proofing our business. Many of the changes that we have implemented over the years have ensured that the business can run easily without us, and I think that's vital to a successful business."

Labour challenges

Moonrocks is continuing to deliver customers and consumers top-quality products; however, the operation has been navigating similar issues to many in the horticulture industry.

"There are always challenges in business, but the biggest one we are facing is shortage of labour," Andrew says.

"Sadly, the Australian agriculture industry has no choice but to rely heavily on an international labour force that has all but vanished due to COVID. Growers across the country are facing a very harsh reality of unharvested crops if a practical solution can't be offered to us soon."

As a business, Moonrocks is doing its best to find solutions.

"We are looking into every option available to us through government programs, as well as looking into innovative ways to sell our farm and our wider community as a great place to work and live. But these avenues demand a huge amount of time and energy from our team, and they can only get us so far – I think the real change can only happen when we come together as an industry to combat this challenge," Andrew says.

"The obvious solution is mechanisation and automation. The more automation that we can introduce to our business, the less risk that we hold when it comes to reliance on staff. And research into these options will benefit the entire horticulture industry."

Andrew points to the introduction of robotics as the only option available to the industry and the Moonrocks business if it wants security in daily operations.

"An international workforce has served us well as an industry, but COVID has taught us that we can't rely on that either, so instead we must turn to other options," he says.

Another area that is vital to Moonrocks' future success is regenerative ag.

"We can't ignore the consumer desire for a deeper knowledge on where their food comes from, and how it impacts the environment. We place a huge importance on soil health at Moonrocks, with an emphasis on cover cropping, minimum till and biological fertilisers. This is an area that we are constantly learning and evolving in, and one that I think the whole industry could benefit from more research," Andrew says.

Industry passion

Despite decades working on the farm, Andrew and David's enthusiasm for growing vegetables hasn't wavered. Andrew says this is mainly due to the wealth of opportunities that are available.

"The horticulture industry is an ever-changing beast – it keeps us on our toes. Each day is different, and the variety keeps things exciting," he says.

"I'm biased, but I really do believe that we work in the best industry in Australia. The horticulture space is full of intelligent, inspiring and hardworking individuals, and we have a valuable network of fellow growers that we rely on – and who rely on us – for advice when it comes to combating many of the challenges that we all face. →

"The challenges present themselves daily and they may not sound very appealing, but I think they play a huge part in keeping the wheels turning. If you don't keep swimming, you'll drown – and I think that's enough to keep anyone going!"

For Andrew and David, a lot of their vegetable growing knowledge is built on years and years of experience, education and – most importantly – trial and error. As Andrew says, it's intellectual property that a lot of the time can only be developed from your own learnings.

"Some of the best implementations at Moonrocks have come from us simply trying something out for ourselves," he says.

However, the business does connect with a network of agronomists and industry peers and looks internationally for ideas and inspiration.

"A lot of value can also be gained from seeing how people do things on an international scale. While it's important to keep an eye on things in your local industry, there is a lot to be learned from horticulture practices in other countries. You often end up learning quite a few 'what not to dos' too, which are equally valuable," Andrew says.

Pride of place

Andrew and David are proud to be fifth-generation vegetable growers.

"Farming is well and truly in our blood. David and I have had some sort of connection to farming since we were born and a career in farming was always on the cards for us," Andrew says.

"It's hard to pick one moment [in our career] as a highlight. Instead, I think it's a culmination of years of hard work and looking at where we are now as a whole. David and I are probably most proud to have a business that one day can be handed down to our children to then put their mark on it."

Additionally, Andrew says winning the 2021 Syngenta Grower of the Year has been a highlight in an otherwise challenging year.

"It's a privilege to be recognised in an industry full of growers who are excelling in their own areas. Beyond that, it is recognition of the hard work that our key staff continue to put in. We are proud to be a part of such a diverse industry," he says.

"The honour of winning a national industry award isn't lost on us and it's certainly been a win for not just us, but our team and small community."

Looking ahead

Andrew predicts the next decade will be like the last for Moonrocks, with further evolution occurring within the business.

"For David and me, our work now is to ensure that we can grow easily with the industry to facilitate those changes – it's all about future proofing," he says.

"We have solid foundations in growing high quality produce, so it's all about keeping those foundations and allowing the rest of the business to adapt as it needs to."

One of the biggest drivers in the development of Moonrocks will always be the end consumer.

"As a business, we need to be able to adapt and evolve based around their needs and desires and there is a lot of work that goes into ensuring that we stay on top of that," Andrew explains.

"The key for us will always be working with what we already have to innovate and grow, and value adding is a huge way that we do this. 'G'day Garlic' has been a big step into that space for us, and we will continue to expand and perfect that range.

"We also anticipate many developments in our cropping practices over the years, in response to the work we are doing in the soil health space. As we learn more, we will implement changes and more beneficial ways of farming.

"I think it's a really exciting time to be in horticulture, and for Moonrocks it's all about embracing modern day technology and research to ensure we are farming well into the future."

POTASSIUM NITRATE BENEFITS ON TOP DRESSING APPLICATION IN ONION

Prilled potassium nitrate (12% N - 38.2% K) is a potassium source that provides rapidly absorbed nitrate-nitrogen, a plant's preferred nitrogen source, with 2-4 mm prill size.

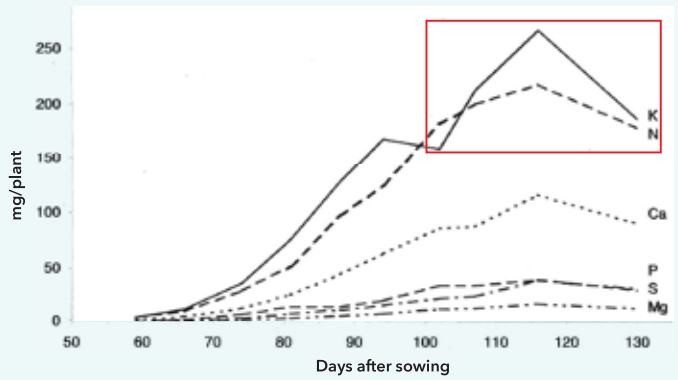
Prilled potassium nitrate (12% N - 38.2% K)

Potassium nitrate provides the ideal N:K ratio during bulb development stage

K and N demand reaches a peak during bulb development stage, when the application of prilled KNO_3 will:

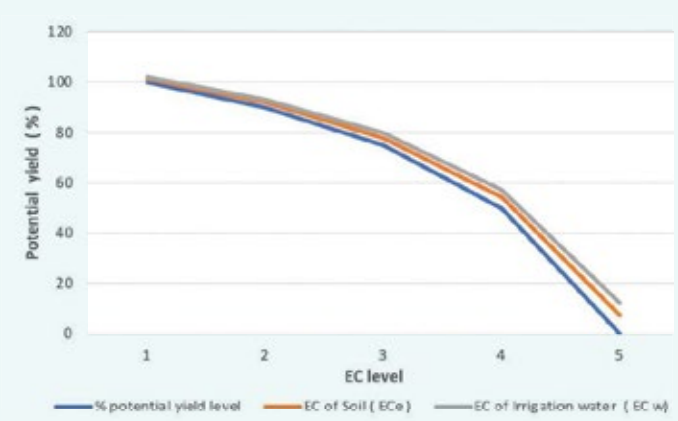
- increase bulb size and weight
- lower the impact on soil salinity (vs SOP or MOP), which affects yield and post-harvest weight losses

Nutrient uptake in onions: high K & N uptake during bulb development stage



Source: Vidigal et al. 2002.

Yield potential at different soil and irrigation water EC (= salinity) levels



Source: Water quality for Agriculture. R.S. Ayers and D.S. Wescot. 1994

Prilled potassium nitrate contains exclusively nitrate nitrogen.

- Fast acting and readily soluble source of nitrogen, directly available for uptake by the roots, independent of the activity of nitrifying bacteria, resulting in faster uptake and greater efficiency for the plant.
- Due its synergistic effect, promotes the uptake of cations: potassium (K), calcium (Ca), magnesium (Mg), copper (Cu), iron (Fe), manganese (Mn) and zinc (Zn).

Prilled potassium nitrate is virtually chloride free.

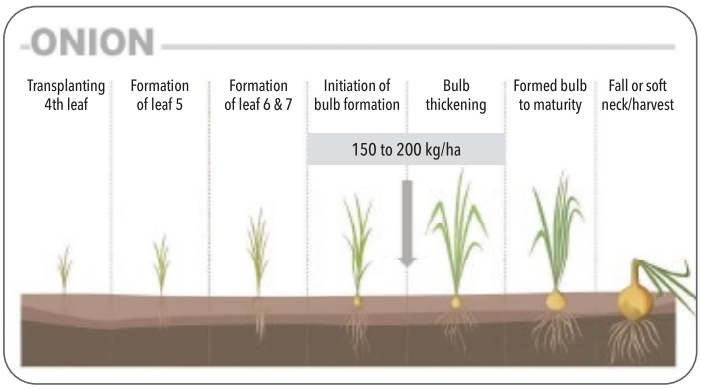
- Yield and quality are negatively affected by chloride. The presence of nitrate nitrogen in potassium nitrate (NO_3^-), acts antagonistically to chloride (Cl^-) uptake if present in soil or water.
- No contribution to soil salinity: both elements, K & N, can be fully taken up by the plant.

Proven benefits of prilled potassium nitrate in onions:

- Increased yield, due to greater weight of bulbs.
- Decreased weight loss during storage and increased shelf life.
- Greater tolerance to diseases such as basal rot and white rot.
- Improved resistance to drought and cold injuries.

Recommendation of use:

Apply prilled potassium nitrate at **150-200 kg / ha**, as **top dressing**, at the beginning or during bulb development stage:



Driving change and opportunities in the hort education space

A third-generation vegetable grower and Managing Director at Velisha Farms, Catherine Velisha has worked tirelessly in recent years to foster a culture of business innovation along with upskilling and education among her employees. Catherine's leadership and her engagement in the wider vegetable industry was recognised at the 2021 National Awards for Excellence, when she received the Boomaroo Nurseries Women in Horticulture award. Michelle De'Lisle reports.

Catherine Velisha has been working within her family business, Velisha Farms, since she was 19 years old. During that time, Catherine has held several different roles, from picking and packing to sales and account management, before transitioning into the owner and managing director position in 2019.

It has been a busy few years for Catherine. As well as being part of vegetable growing operations at Werribee South, Caldermeade and Shepperton in Victoria – along with a variety of partner growers – Catherine has transformed Velisha Farms as a business, creating a model of continuous improvement, growth and expansion, and investing her employees' education and skillsets.

In addition, Catherine has established the Velisha Education Group (V.E.G.), a program that assists horticultural enterprises to navigate their way through the Australian business world with a focus on compliance and the changing legal landscape. She also received a Nuffield Scholarship in 2020, with support from Hort Innovation, to undertake research into the need for education within horticultural businesses and how businesses can utilise and facilitate education for their own growth.

Catherine was duly rewarded for her dedication to the horticulture industry and the vegetable sector with the 2021 Boomaroo Nurseries Women in Horticulture award. Catherine was also a nominee for Syngenta Grower of the Year, and in May this year she received the AUSVEG VIC Community Stewardship award for her involvement in the Farms2Schools Program, an innovative six-month program introducing students to growers and agricultural industry workers within Greater Melbourne.

2021 Boomaroo Nurseries Women in Horticulture award winner, Catherine Velisha.

Education focus

Enhancing business capabilities was a reason behind Catherine's decision to establish the V.E.G. Program. She did this in partnership with corporate lawyer and RMIT University employment and safety law lecturer, Neil Salvador.

"V.E.G. has been created by us, for us. We know the areas of struggle – the areas that are hard within our business and places that need support within our industry. We created V.E.G. to try and find solutions for all businesses within horticulture and allow us to present to the industry a strength-based and opportunity-focused dialogue," Catherine says.

Through the initiative, a farm safety program has been created along with a comprehensive online induction that can be used by all horticulture workers and businesses.

V.E.G. also has a program that focuses on the whole supply chain – as Catherine describes it, "from seed to stomach within a living classroom."

"It's so great to speak to kids not only about where their food comes from, but to talk about all the career opportunities that are available and encourage them to consider horticulture," Catherine says.

While her role within Velisha Farms hasn't changed in recent years, Catherine says her perspective has evolved and matured.

"My leadership style has become a little more well-rounded and holistic – I'm less narrowed in my focus when I make decisions. I look at ways in how Velisha Farms can evolve and grow, but within the context in how we can also contribute to the industry," she explains.

"I think what drives me most in my role is trying to facilitate my team members to be able to step up and reach their full potential. I focus on giving them the ability to experience and learn in different ways; not only within our business, but also through different avenues presented to us by industry."

Again, education is key at Velisha Farms.

"As a business, we've always been passionate about training our staff up and creating different pathways for them; particularly in the leadership management model and we really see that there's a need for that within the horticulture industry, especially in middle management," Catherine says.

"So, V.E.G. is focusing on leadership and that kind of skillset for those types of members in the business. There's also a really strong safety slant to V.E.G., because that's another area we're feeling where we fall down a little bit as an industry.

"We do need to hold some responsibility for that, but more importantly the courses or the programs that have been run have never really been unique or specific to the needs of the industry. That's why we created V.E.G. because it has that 'by us for us' platform. We understand the gaps, the needs – where we struggle ourselves in business. To facilitate change, you need to create a product that identifies what the gap is and not just something that is cookie cutter or standard."

Catherine Velisha (right) with celebrity chef Mike Reid, who appears on *My Market Kitchen*.

Veg on the small screen

Last year, Hort Innovation presented Catherine with the opportunity to be featured on Channel 10's cooking television series *My Market Kitchen* – an experience she really enjoyed.

"Being growers and consumers, we just thought it was a natural fit. It gives us a great platform to showcase horticulture and vegetables in a vibrant, exciting way," Catherine says.

"We are passionate about showing people how to cook vegetables in different delicious ways and encourage more people to think about vegetables as a main ingredient, not just a side.

"I think cooking shows let us, as producers, talk to our customers hearts and bond over what really is the cornerstone of all life – food! We grow it, you eat it, we eat it, and everyone loves it!"

Raising a voice

Catherine enjoys the networking and learning opportunities that industry engagement provides. She also believes it is important to have a voice or create a voice for those can't speak up on industry issues and influence change.

"I think that's probably where that driving force is. I feel that the conversation around horticulture is quite tiresome sometimes in the media; I don't think it shows any opportunities that are available in what is a multi-faceted industry. I think sometimes it is a bit tired and a bit negative, and people just tune out," Catherine says.

"It's about trying to speak about it differently. I'm probably a little bit of a different face, so that sometimes helps with messaging.

"The other real thing that drives us is to make sure that our leaders within our business have a platform to have their voices heard.

"There is an opportunity to make sure that we've got multicultural faces and voices, and different genders and different life experiences at those tables talking about greater industry standards and issues – and not just from the same voices that there have been historically."

The final word

Catherine was humbled to receive the Boomaroo Nurseries Women in Horticulture award, and she credits her team for her industry success.

"Winning any award is nice from a personal point of view, but what I enjoy is the pride that my team members get from that," she says.

"It reinforces what they have achieved and the direction they are taking together. It's a really good milestone on the journey that we can all point to and say, 'we're working towards the right direction.'

"It's a little island in the middle of the ocean that you get to have a little rest on – and then swim to the next one."

Catherine Velisha (right) pictured talking with grade three Victorian school student, Aahana Vora from Southmoor Primary School.

AUSVEG National Public Affairs Manager Tyson Cattle.

Australian Agriculture Visa announcement delights growers

AUSVEG – along with the rest of the agriculture and horticulture sector – has advocated strongly for the Australian Agriculture Visa for many years as it is a critical element to ensure growers can access a reliable and efficient workforce. While there is certainly still a lot of work to be done, and details to be worked through, there are already many commitments that will support Australia's vegetable and potato industries. Tyson Cattle reports.

It's great to get a commitment from the Federal Government– specifically a delivery date of 30 September for the regulations to enable the creation of the Australian Agriculture Visa (Ag Visa) to be put in place.

There had been various levels of commitment to the Ag Visa over many years, so it is great to have a deadline that government and the relevant departments are working towards.

The Ag Visa will initially target ASEAN countries; however, there will potentially be scope to have this expanded to other countries as it evolves.

While details are still to be finalised, the Ag Visa will likely be a four-year, multi-entry visa, with a potential to provide a permanent residency pathway for those who are willing to spend time in a regional area.

The visa will include some English language proficiency requirements and will cover all skill levels from unskilled, semi-skilled to skilled workers, complementing the existing Seasonal Worker Programme and Pacific Labour Scheme.

More details will become available in the coming weeks and months. However, there are some core-guiding principles that AUSVEG will continue to be led by.

Integrity

The integrity of the Ag Visa is the absolute number one priority.

The Federal Government, particularly the Nationals, have gone out on a limb to deliver this visa, which is normally outside of the remit for Australia's immigration system.

That's not to dismiss the need – the Ag Visa is certainly needed. However, because it is outside of Australia's normal visa approach, it naturally brings with it additional pressure. That, mixed with previous reports of exploitation in the horticulture sector, means there will be additional scrutiny of the program.

The reality is the integrity of the visa needs to the priority. A visa program such as this, which has taken years to develop, can be taken away in an instant.

The success of the Pacific Island programmes, which deliver a more productive workforce, has come largely on the back of the Approved Employer program.

A key element of being an Approved Employer is that a grower business must demonstrate that they are 'fit and proper' and meet a certain employer standard. Growers will need to demonstrate that they meet high workplace standards to be able to access workers under the Ag Visa.

Accessibility for growers

Growers should not shoulder a heavy administrative burden, or steep costs, to access workers under this visa.

High application costs to become a sponsor and excessive delays in processing times are issues with other visa pathways. Industry is committed to removing these barriers to entry for growers as much as possible.

If a grower can demonstrate they are 'fit and proper' in a reasonable way, then they should be able to access the programme.

Portability and mobility

Growers have said time and time again that portability and mobility of the workers between farms is a critical element that must be included in the visa, including the ability to easily move and transfer workers from farm to farm and from employer to employer.

This must be an efficient and effective process for both the employee and the employer's benefit.

It is important for the employee, or visa holder, to move where the work is needed so they can maximise their earnings.

This approach will also support employers to respond to peaks and changes to their seasons – if a harvest period is shortened or extended due to climatic conditions, then it provides the employer with some flexibility to extend its engagement with the worker, and the worker an opportunity to stay or go and follow the work.

This is no doubt a challenge in the design – and it would be unique to the Ag Visa, but it is a critical feature for the visa to meet the needs of growers.

We will need to continue to work through a range of other parts of the visa with government, and there is still a long way to go.

However, the industry is in a strong position and, if delivered right, this visa has the ability to change the workforce makeup for the vegetable and potato sector for years to come.

Introducing AUSVEG Policy Officer, Chloe Betts


AUSVEG's new policy officer, Chloe Betts.

I joined the AUSVEG team in July this year, working alongside Public Affairs Manager Tyson Cattle from our Melbourne office.

The first month in the role has been a steep learning curve as I have been getting my head around all the issues in the agricultural space. It has been insightful to learn what is happening and my passion for the sector has strengthened.

I recently graduated from the University of California, Berkeley after completing a major in Conservation and Resource Studies with a focus on Agroecology and Sustainable Food Systems. Learning about the problems in the United States has helped me to understand current issues in Australia.

In California, I worked on community farms and was lucky enough to work with professors who are helping to uncover and push for change in the food systems of the Americas.

Earlier this year, I worked at Gemtree Winery in South Australia as a cellar hand where I helped to press the 2021 Vintage. I also worked at the Black Cat Truffle Farm in Creswick – located in west-central Victoria – which was a unique and interesting experience.

I am excited to bring my unique perspective and experiences to this position and help to advocate for positive change on behalf of the Australian vegetable and potato industries.

I hope to be able to meet growers when I can and hear about their experiences. In the meantime, please feel free to contact me by emailing chloe.betts@ausveg.com.au.

Find out more

Please contact AUSVEG National Public Affairs Manager Tyson Cattle on 03 9882 0277 or email tyson.cattle@ausveg.com.au. Further details can be found at ausveg.com.au/ausveg-advocacy.

Key visas for the vegetable and potato industries:

- **Working Holiday Maker program** – The 'backpacker visa' continues to be used widely in horticulture for picking and packing roles.
- **Seasonal Worker Programme** – The SWP allows Approved Employers access to low-skilled workers from the Pacific Islands
- **Pacific Labour Scheme** – The PLS allows access to workers from Pacific Islands low and semi-skilled roles for up to 3 years.
- **Horticulture Industry Labour Agreement** – Allows horticulture growers access to semi-skilled and skilled workers from anywhere in the world under 31 occupations. The HILA includes a range of concessions specific to the horticulture industry and has a pathway to permanent residency.

Pacific Island workers

The Prime Minister recently announced a commitment to Pacific Island nations to bring in a further 12,500 Pacific Island workers into Australia by March 2022.

Since the Seasonal Worker Programme restart in July 2020, Australia has brought in more than 10,000 seasonal workers, predominantly for the Horticulture and Meat Processing industries.

At the time of writing, quarantine pathways currently exist for in all states, except from Victoria, to bring in seasonal workers.

Growers are urged to lodge their harvest workforce needs through their SWP applications as soon as possible, or if they are not Approved Employers then they are encouraged to contact a labour hire contractor who is an Approved Employer to ensure they are given the best opportunity to access workers.

If you are not yet an Approved Employer, you are urged to reach out to your nearest Approved Employer labour hire business.

The Butler Market Gardens harvest team pictured in the paddock.

Culture and people focus for horticultural business

Despite challenges emerging from recent droughts and the COVID-19 pandemic, one vegetable growing operation has flourished. Thanks to a major organisational restructure that took place in 2019, Butler Market Gardens continues to thrive, with almost 200 staff employed directly across many facets of the business.

Circumstances have changed for growers in recent times. Over the past three years, severe drought has impacted many businesses. More recently, COVID-19 has thrown up even more challenges, with suppliers to the food service industry losing significant sales as well as travel restrictions significantly reducing the availability of a suitable labour force. Typically, the horticulture industry relies on a large number of seasonal and overseas workers.

Butler Market Gardens (Aust) Pty Ltd® (BMG) – an Australian-owned sixth-generation business located in Melbourne's south-east – has been able to overcome these obstacles and continue its growth strategy through careful planning and diversification of its operation and supply points.

A grower of spring onions, herbs, Asian and other bunched vegetables, BMG's operations are very labour intensive and therefore, the business is reliant on good staff.

The diversity of growing environments, (a mix of field and heated greenhouses), means BMG grows products 12 months of the year. While there is a reduction in growing times during the winter months, staff are employed all-year-round.

Two years ago, BMG implemented a major organisational restructure that resulted in a flatter and broader structure, aimed at improving communication and for providing better input into decision-making. This has led to a more hands-on, dynamic, and adaptable management team. Since these changes were implemented, the business has gone from strength-to-strength by developing a work culture that is underpinned by the core values of leadership, quality, innovation and sustainability.

Staff development

Specifically, BMG is excelling in the management and employment of 190 staff. All staff are employed directly by the business, with no use of contracted labour hire. This was a decision made over four years ago, and the company sees this as one of its best decisions and a competitive advantage over its competitors.

Staff work in a wide range of occupations, including farm and protected cropping production, harvest, packing, quality management, transport, maintenance, accounting, sales, marketing, human resources and safety. The business operates 24 hours a day as it has night drivers delivering produce and a wholesale market team selling to green grocers and other retailers, ensuring the freshest product is available to Victorian consumers every day.

BMG provides staff with challenging positions that they enjoy, along with the opportunity to learn and grow and ultimately, have a long-term career in the horticulture industry. It does not need to source staff from great distances – all staff are local to Melbourne's south-east region. This provides the business with a great local feel, where staff are proud of the consistent high-quality products produced in and around the area that they live.

"Our people are our biggest asset, and we are continually working on strengthening our staff to ensure they are safe, productive, challenged, rewarded and know they are appreciated each day for their hard work and commitment," BMG General Manager - People, Culture & Safety, James Donovan, said.

The business is also proud to be Sedex compliant, leading the way in ensuring that standards of labour, health and safety, environment and business ethics are all to a high standard.

Its next focus is to continue this transformation, particularly looking at production expansion and adoption of new technology to assist with communication, accuracy of information, and reduction of paper.

BMG's market team.

Find out more

For further information, please contact BMG General Manager – Sales & Marketing Andrew Smith on 0402 273 330 or email andrew@butlermarketgardens.com.au or visit butlermarketgardens.com.au.

Syngenta goes to great lengths in the stewardship of its products, making tank mixing and application quality a key topic at GrowMore field trials.

Spray tank mixes: What growers need to know

There is no easy answer to spray tank mixes, but there are steps that vegetable growers can take to ensure successful application. Syngenta Technical Services Lead Shaun Hood discusses product compatibility and what to look for when mixing sprays in the tank.

Depositing multiple products through the spray boom can be timesaving and efficient for vegetable growers. However, they need to be compatible and when it comes to new or untried tank mixes, it can be a daunting proposition – even for the professionals.

Compatibility questions sometimes put us on the spot; they are invariably time critical, and the long-term implications can be serious if incompatible products are used.

Here's a sample question from a grower:

"Hi, I'm filling the spray tank and I'm about to spray MINECTO® FORTE for caterpillars and aphids, I'm adding Hasten, just checking I can tank mix ORONDIS® FLEXI and BRAVO® Weather Stik®?"

Whenever I'm asked a question like the above, there are a few crucial things I need to know. Are they interested in physical compatibility, biological compatibility, or crop safety?

At the point of mixing, growers want to know that the mix will be okay in the tank and that it will not clog the nozzles (in other words, it's physically compatible). Getting the tank mix order right, using clean potable water and three-quarter filling the tank prior to adding the products, will help with physical compatibility. If there are any doubts, read the product labels and conduct a jar test. Always let the mixture stand 15-30 minutes and then look for signs of incompatibility.

Further advice

Growers will also want to know that the tank mixture is safe on the crop. When an R&D company like Syngenta develops new products, we evaluate crop safety when we are establishing the application rates, and we also test some common two-way tank mixes.

However, it is virtually impossible to test all possible combinations on all crops, varieties and growth stages. If there are any doubts, it is recommended that you spray a small section of the crop to check crop safety.

Often overlooked is the impact that tank mixtures can have on the biological activity of the pesticides. While some products, when mixed, can have a synergistic (positive) effect on efficacy, other mixtures can have antagonistic activity, which means that efficacy could be compromised. For this reason, don't assume products in a mixture will perform like they would if they were applied solo.

Spraying is a science and there are lots of variables to consider. It takes years of experience to know the mixtures that are likely to be compatible and mixtures likely to be trouble.

Always read the product labels and consult an experienced local agronomist for advice prior to trying a new mixture.

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*: communications@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.

Hort Innovation Strategic levy investment | VEGETABLE FUND



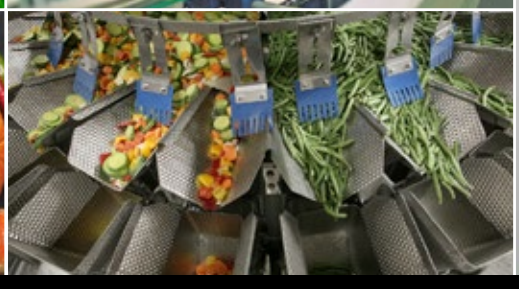
Complete Vegetable solutions **designed for your business**

- Produce Handling & Storage
- Peeling, Grading, Washing
- Electroporation
- Cutting, Pureeing
- Value-added Processing
- Product Handling
- Weighing & Filling
- Inspection & Packaging










Across industries and applications, we design specialised solutions.

Bringing together leading brands in processing, inspection and packaging equipment for the vegetable industries. Our solutions set the standard for yield, efficiency, and safety across a wide range of industries. Whatever your product needs, we can meet it with precision and passion.

HEAT AND CONTROL | FastBack | Spray Dynamics | MASTERMATIC | ISHIDA | eia | URSCHEL The Global Leader in Food Cutting Technology | KEY TECHNOLOGY

info@heatandcontrol.com | heatandcontrol.com

Bowen GrowMore Field Day hailed a success

In June, AUSVEG Biosecurity Coordinator Callum Fletcher attended the Syngenta GrowMore Field Day held in far-north Queensland. Here, Callum provides a snapshot of the event and what he learnt.

Not a single Group 28 insecticide was applied to this rockmelon crop. Instead, Syngenta used one of its pipeline products featuring an all-new mode of action for control of key lepidoptera and mite species. The product will be registered into numerous vegetable crops including brassicas, onions, cucurbits, Solanaceae and fruiting vegetables.

Last month, I was invited to attend Syngenta's GrowMore Field Day in Bowen, Queensland. I am currently based with the Department of Agriculture, Water and the Environment on secondment with its Northern Australia Quarantine Strategy program in Cairns, so this provided a good opportunity to connect with growers and scientists working in the region. My main focus area is pests and diseases that have or are about to arrive in the country, and seeing what was being presented to industry by Syngenta offered a great opportunity to learn as well as connect with local experts.

Growers in Bowen and the surrounding growing regions are acutely aware of the impact that new or evolving pests and diseases can have on their production systems and profitability. As observed at GrowMore, it can be a fine line from successfully harvesting a high yield crop and the heartbreaking losses caused by the untimely or undetected arrival of a fungal infection or a flight of insect pests.

The site chosen for the field demonstration was the Department of Agriculture and Fisheries, Queensland's Bowen research facility, which was perfectly placed for trial plants to be grown and easily accessed by local industry on the day. The key focus areas of the event were to show new fungicide and insecticide technology and delve into a new solution for root knot nematodes for the Australian horticulture market.

Crops on-show

Three melon crops and trellis tomatoes were on display at the site. Each had an untreated area and one that had been managed with a spray regime that included Syngenta products that are in various stages of development for registration. Particularly interesting was a brand-new insecticide belonging to the group 30 class of insecticides. This is a completely new mode of action, meaning that it has the potential to work in a new way to manage target insects. There was also much interest in MIRAVIS® Duo, a new fungicide that will be registered for a range of vegetable crops. MIRAVIS Duo is not registered; however, an application has been submitted to the Australian Pesticides and Veterinary Medicines Authority.

What was truly impressive about the day's activities was the levels of interactive learning that the event offered. For those that could not attend, there was live cross that allowed people from around Australia to have a virtual on-site presence. Those who attended in-person were shown caged colonies of beneficial insects, and they could see the impact that various insecticides have on these important natural sources of pest management. Furthermore, to illustrate the impact that root knot nematodes can have on nutrient uptake and the crops root systems, inoculated samples were provided to participants. Volunteers washed the root systems clear to reveal the nematode caused knots that were stunting growth. It was a great illustration of the need to test and treat for nematodes, especially in sandy soil.

For me, the Syngenta GrowMore field day in Bowen was a truly fascinating event showcasing the importance of crop management for a range of significant horticultural pests and diseases. With more Syngenta field days being planned for other growing regions in Australia – including Tasmania – it would be well worth looking to attend.

Find out more

Please visit syngenta.com.au/field-trial/horticulture-sites.

Syngenta Technical Manager Rob Vitelli explains the development of a trickle treatment for application of a new nematicide to control root knot nematodes.

Providing Australia's veg growers with an innovative irrigation solution

Taking control of an irrigation system's flow rate can prove to be an expensive and time-consuming exercise for vegetable growers. However, an Australian-made drip tape is available on the market to help growers with the uniformity of their flow rate and improve overall irrigation efficiency that can lead to better yields, even in challenging terrain that might otherwise be impractical to farm.

Drip irrigation is a mainstream technology in dozens of crop production systems throughout the world. It allows producers to evenly spoon-feed precious water and nutrients directly to every plant's root zone despite variable soil conditions, undulating terrain, odd field dimensions or long lengths of run.

Designed to give Australian growers the best of both worlds with optimal features of a pressure-compensating tape and non-pressure compensating tape, Toro® Aqua-Traxx® FlowControl™ Drip Tape offers more uniform irrigation for any terrain and the flexibility to control the overall system flow rate.

Trusted to bring the best in drip tape solutions, it can help vegetable growers take control of their irrigation system's flow rate efficiently and economically.

For years, growers have dealt with irrigation technology that is unable to consistently water uneven, sloped and hilly terrain – trying to achieve a healthy crop at low and high elevations can prove challenging. With Aqua-Traxx FlowControl technology, growers can move away from poor performance irrigation systems, start to meet market demands and be prepared for unpredictable weather patterns.

While standard drip tapes offer growers the ability to apply water and nutrients efficiently, uniformity is sacrificed over longer runs and uneven ground. However, with FlowControl's unmatched patented emitter flowpath, clog resistance and precision placement of valuable water and nutrients, longer runs are made easy with better uniformity in steeply sloping fields resulting to higher quality yields for growers.

"Aqua-Traxx FlowControl gives the grower a valuable tool to help improve the irrigation uniformity, crop yield and quality," Toro Territory Manager Tony Townson explains.

"Growers with difficult terrain and changing elevations in Queensland's Bundaberg and Mareeba regions are getting the most out of their yields, without the additional cost."

Grower benefits

Before, growers who wanted consistency and quality over their challenging terrain had to resort to expensive heavy wall pressure-compensating drip lines with closer emitter spacing. But with a wide range of available thicknesses compared to pressure-compensating drip lines, FlowControl provides a cost-effective solution for those farming on challenging terrain. Its ability to run over long distances also reduces set-up costs.

Available in wide range of wall thicknesses, offers one price point for any emitter spacing between 15 and 60 centimetres – providing growers with their desirable wetting pattern, without the extra costs.

Readers can visit aquaflow.toro.com to make their own comparison and learn how this product can improve their system's performance.

Meanwhile, Toro's free drip irrigation design software – AquaFlow™ – allows growers to see how different products will perform for each unique application. It calculates emission uniformity (EU) and generates colour-coded Uniformity Maps to help select the right product configuration for specific application.

Find out more

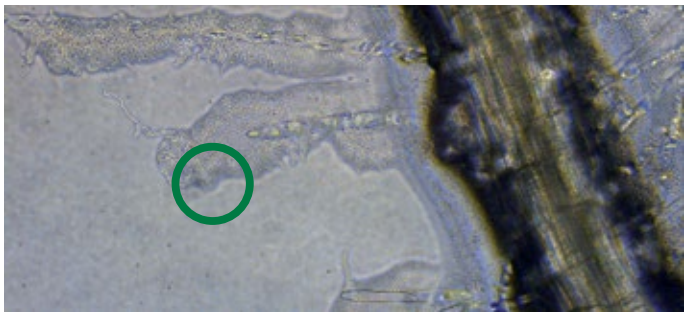
Please visit toroirrigationsolutions.com.au or visit your local Toro dealer.

Local Broccoli Results

SERENADE® PRIME

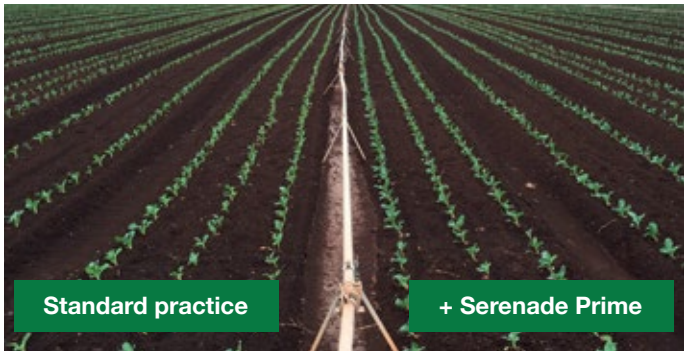
'It all starts here'...

Serenade® Prime is a beneficial bacteria that colonises broccoli roots. It creates a win-win relationship with the plant at the soil interface, improving nutrient availability. Frequently this results in improved harvest uniformity.



Harvest Uniformity

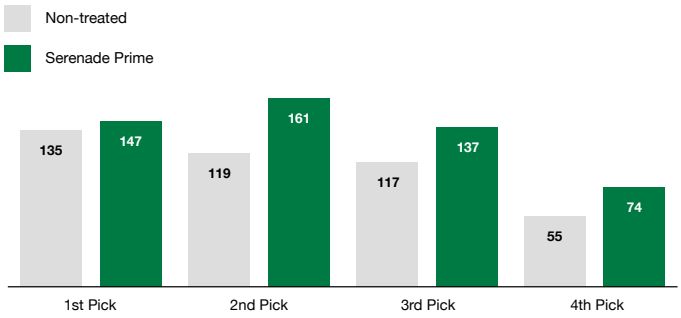
Windolf Farms, Gatton Qld improved yield of Aurora broccoli by over 12%. Greater early vigor (below) and earlier head maturity was observed in the July planting, and better uniformity in the first three picks.



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.

Weight (kg) by harvest round* June 2016



Find out more at serenadeprime.com.au

Certified Allowed Input
ACO CERT. NO. 13029

More affordable. Less food waste.

At Woolworths, we believe that good fresh food shouldn't be wasted. That's why we have a range of fruit and veggies called The Odd Bunch.

They're affordable and adorable, and they also help our farmers sell more of their crops.

That's today's fresh food people.

Woolworths

Scouting a citrus crop for white fly. Image courtesy of Shutterstock.

Giving Australian agricultural diagnostics a booster shot

A number of Australasia's top research institutions have joined forces to develop diagnostics tools that aim to keep pests at bay and maintain good biosecurity across plant production industries. In this article, AUSVEG's Ian Thomas outlines the extension activities being undertaken as part of the *Boosting Diagnostics for Plant Production Industries* project.

Plant pests and diseases have been the burden of growers since the beginning of agriculture. The disruption to trade while diagnostic decisions are being made can be costly to businesses and trade, and reducing this timeframe will be crucial in the coming years as disease and pest pressure rises due to increased global trade and climate uncertainty.

To prevent incursions and stay on top of good biosecurity practices, modern, quick, and accurate diagnostic tools need to be available to growers and diagnosticians Australia-wide.

In 2019, a Rural R&D for Profit program entitled *Boosting Diagnostic Capacity for Plant Production Industries* (or Boosting Diagnostics) commenced. Led by the Grains Research and Development Corporation, Boosting Diagnostics seeks to increase Australia's ability to detect, contain, and eradicate plant pests and disease outbreaks.

In recent years, the development of DNA identification tools such as LAMP, qPCR, and MinION (Oxford Nanopore) make it easier than ever to identify pests and diseases on-farm, but for these tools to be effective there is a lot that must first happen. Assays for identification must be developed and tested, both in the field and the laboratory. Reference samples must be secured and categorised. Protocols need to be developed, tested, and tested again.

Boosting Diagnostics supports the development of new diagnostic tools, underpinned by strong communication and extension activities to raise awareness of these tools among diagnosticians and industry. This will assist in early, rapid, and accurate detection of pests and diseases on-farm and allow swift and precise responses from industry.

It is not solely about detecting the presence of pests and diseases, but also their absence. Australia is thankfully free from many pests and diseases that plague the rest of the world. This absence – and our ability to prove it – allows Australian growers access to markets all over the world. The extra capacity provided by Boosting Diagnostics will help provide strong scientific evidence that our growing regions are free from pests and diseases.

Extension and communication activities

Throughout the remainder of 2021 and 2022, AUSVEG will be coordinating the extension and communications component of Boosting Diagnostics to deliver the many and varied project outcomes into the hands of those who will use them day-to-day. These activities will be delivered in two streams: the Diagnostic Stream and In-field Stream.

The Diagnostics Stream will focus on delivering developed technologies, protocols and expertise to diagnosticians and lab-based personnel through relevant diagnostic events and activities. Meanwhile, the In-field Stream will focus on in-farm triage and translating the diagnostic knowledge to actionable on-farm capacity and capability. This component will target professionals working in the field, ranging from agronomists, field pathologists, biosecurity officers, state surveillance staff and growers.

AUSVEG will run seven workshops in different regions across Australia, each focusing on the pests and diseases impacting each region's industries and addressing their specific requirements. During this process, AUSVEG will increase the awareness and knowledge of selected National Priority Plant Pests (NPPPs), provide updates on project activities, and deliver updated resources to diagnostic personnel across the plant production industries.

Pest and disease targets

Boosting Diagnostics will focus on a variety of target plant pests and diseases affecting a broad range of plant industries. These include the cyst nematodes of the genus *Heterodera* (pests of grains and vegetables), *Xanthomonas citri* subsp. *malvacearum* (the cause of bacterial blight of cotton), and spotted wing drosophila (*Drosophila suzukii*; a potential threat to berry and wine production), among many others. The individual projects are broad and varied, and approach the issue from different angles.

CSIRO Research Scientist Dr Mike Hodda is working to organise the complicated taxonomy of *Heterodera* nematodes.

"We are building a collection of local →

Xanthomonas citri subsp malvacearum symptoms on cotton. Image courtesy of Clemson University – USDA Cooperative Extension Slide Series, Bugwood.org.

Spotted winged drosophila (*Drosophila suzukii*) larvae. Image courtesy of Hannah Burrack, North Carolina State University, Bugwood.org.

and exotic species so that we can work out what is in Australia and what is not, and how to distinguish them," Dr Hodda said.

"The benefits to vegetable growers will be better recognition of cyst nematode issues; faster, cheaper and more reliable diagnostics; better management options; and enhanced market access through area freedom."

Cyst nematodes can occur in many crops but are notoriously difficult to diagnose as symptoms of their damage are easily mistaken with nutrient deficiency or drought stress. Dr Hodda advises that growers look for damage that occurs in a lens or oval shaped area and is pointing in the direction of cultivation, as well as expanding by a few metres each year.

"The nematodes themselves are just visible to the naked eye as white, beige, or brown balls about the size of pin heads protruding from roots," Dr Hodda explained.

CSIRO is putting a call-out for samples from any vegetable growers who believe they may have cyst nematode issues in their crops.

"To submit samples, growers should collect a handful of affected roots into one plastic bag, and a few hundred grams of surrounding soil into another bag, label them both with your name, location, and the crop, and keep them cool."

Further tools

Dr Andrew Weeks from Cesar Australia is developing diagnostic tools that use environmental DNA (eDNA) to identify pests without needing direct insect collection. eDNA is left behind in frass; that is, excrement from the digestive system of various pests, or on feeding sights. It can be used to help identify pest species presence – even when they may not be found.

"The eDNA diagnostic tools, sampling approaches and factsheets developed through this project will enable more rapid identification of some high priority plant pests, allowing more effective management intervention to be undertaken to prevent or limit incursions or outbreaks," Dr Weeks said.

"The project will assess the feasibility of moving the technology into the field. We envisage the technology could be rolled out in some form within the next two-to-three years."

Each Boosting Diagnostics sub-project is a small piece of a larger puzzle. As each one falls into place, the picture of what improved diagnostics and better biosecurity looks like for Australia's vegetable growing sector will begin to take shape.

Industry collaboration

The *Boosting Diagnostics for Plant Production Industries* project is a partnership between the Grains Research and Development Corporation; Cotton Research and Development Corporation; Horticulture Innovation Australia Ltd; Wine Australia; Sugar Research Australia Ltd; Forest and Wood Products Australia Ltd; AgriFutures Australia; Commonwealth Scientific and Industrial Research Organisation (CSIRO); Minister for Primary Industries and Regional Development (SARDI); Western Australian Agricultural Authority; Department of Jobs Precincts and Regions (VIC); Department of Agriculture and Fisheries (QLD); Department of Primary Industries (NSW); Department of Primary Industry and Resources (NT); Biosecurity Tasmania; Plant Health Australia; Plant and Food Research; AUSVEG Ltd; Cesar Pty Ltd; and Bio-Protection Research Centre.

Find out more

Any vegetable growers who would like to submit samples to the CSIRO's nematode project can contact Dr Mike Hodda on 02 6246 4371 or email mike.hodda@csiro.au. Unfortunately, the project is currently unable to collect samples from potato growers.

For further details about the Boosting Diagnostics project, please contact AUSVEG Project Officer Madeleine Quirk on 03 9882 0277 or email madeleine.quirk@ausveg.com.au.

This project is supported by the Grains Research and Development Corporation through funding from the Australian Government Department of Agriculture, Water, and the Environment – as part of its Rural R&D for Profit program – and the Cotton Research and Development Corporation, Hort Innovation, Wine Australia, Sugar Research Australia, and Forest and Wood Products Australia.

Australian Government
Department of Agriculture, Water and the Environment


Mulgowie Farming Company's Sustainable Farming Practices Manager, Andrew Johanson.

Collaboration key to kicking environmental goals

Andrew Johanson is Mulgowie Farming Company's Sustainable Farming Practices Manager. In this article, AUSVEG EnviroVeg Coordinator Danielle Park catches up with Andrew to learn more about Mulgowie's approach to environmental sustainability, its involvement with the EnviroVeg program and the importance of teamwork and collaboration when it comes to implementing change across five different regions.

Mulgowie Farming Company oversees vegetable growing operations that span 5,000 hectares of land strategically located down the eastern seaboard of Australia. To ensure continuous year-round supply and mitigate weather events, Mulgowie's farms and packing facilities are spread from as far as Home Hill in north Queensland, down to Boisdale in Victoria's central Gippsland region.

With a long history of adopting and promoting good agricultural practices, Mulgowie chose to include four properties in the EnviroVeg Program's pilot phase in 2019.

The EnviroVeg program allowed each of the Mulgowie farms participating to review current practices against best practice, as well as use the benchmarking capability to visualise each of its farms.

Many of the EnviroVeg components aligned and supported the farm plans that Mulgowie was working with its team to develop, including improving water efficiency, reducing pollution risk and pesticide use, preventing soil erosion, and increasing soil carbon to leverage plant health.

EnviroVeg training was held on Mulgowie farms in Queensland and Victoria, allowing farm teams to work together, review current practices and identify opportunities to collaborate and continue to improve in key areas.

Following the pilot phase, additional farms have elected to join the EnviroVeg program.

Operational focus

Sustainable Farming Practices Manager Andrew Johanson says farmers at Mulgowie are continually learning about the land and how to protect it.

"Mulgowie farmers keep the environment at the forefront of decision-making," he says.

In his role, Andrew's key focus is to prevent soil degradation and the loss of microbiology and organic matter. He does this by working with the Mulgowie team across the different farms and regions.

"The goal is to farm sustainably, while reducing inputs. We have been able to achieve this by improving soil condition, microbial activity, worm populations, composting, controlled traffic, minimum or no-till, and cover cropping," Andrew explains.

Mulgowie has invested in environmental practices that have led to further improved operational efficiencies and economic benefits. These have been a result of reductions in fuel and electricity use, fewer irrigation and fertiliser requirements, less soil loss and reduced labour costs.

"The team at Mulgowie takes great pride in developing new methods that improve water use, soil, plant quality and reduces water pollution, which have resulted in improvements to our fresh vegetable produce, including increased shelf-life, improved taste, and better nutritional levels," Andrew says.

Mulgowie also has a soil health strategy rolled out across all farms. The operation's commitment to soil fertility has seen the

farms engage in a composting initiative, with organic matter mixed in with mill mud applied to the soil. Additional green waste is used in other composting and waste utilisation initiatives.

"As one of Australia's larger vegetable farmers, we're vertically integrated to ensure quality control from the soil to the plant, to the product and shelf," Andrew says.

"Our farmers have a deep commitment to sustainably managing the environment and producing nutritionally rich plant-based food to support our community's health and wellbeing."

Sustainability, productivity and carbon goals

At Mulgowie, the stated focus is 'Healthy Soils, Healthy Plants, Healthy People'.

"Growing great nutritious vegetables and preserving that nutritional benefit through to the consumer is our goal. The fact that improving our soil also results in carbon sequestration and 'net negative' at the farmgate is a very welcome side benefit," Andrew says.

The team approach and collaboration across Mulgowie farms and regions includes the implementation of cover cropping, controlled traffic farming, and minimum tillage.

"The move to zero or strip tillage has shown an immediate result in plant vigour, yield and resilience," Andrew explains.

"We've also observed improved soil water infiltration and water holding capacity, while soil has become more friable."

To understand the impact of these practices beyond their production benefits, Mulgowie has begun working with Carbon Friendly® – an international accounting methodology that is based on the Greenhouse Gas Protocol guidelines and directives.

"We track our carbon sequestration using a certified Carbon Friendly® farming operations method to show a reduction in greenhouse gas emissions for the same agricultural crop or product over the same period of time," Andrew says.

"Retaining carbon in soil, building organic matter and improving water holding capacity are further challenges of modern agriculture."

Plants have also been seen to be more resilient to increased occurrence and severity of weather extremes.

Mulgowie has been better able to maintain supply to customers during the last severe drought when others could not as a result.

Participating in EnviroVeg

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.

The 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.

Find out more R&D

For help with accessing the EnviroVeg self-assessment, please contact AUSVEG EnviroVeg Coordinator Danielle Park on 0432 324 822 or email 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

The snacking capsicum crop planted for teaching and research purposes.

Fostering leadership in the protected cropping industry

In 2020, Western Sydney University joined forces with Hort Innovation and five industry partners to establish the Masterclass in Protected Cropping, a one-year course that offers a range of graded qualifications culminating in a Graduate Diploma (Protected Cropping). These courses stem from a partnership under the Hort Frontiers Leadership Fund – *Emerging Leaders in Protected Cropping* (LP18000) – and include a combination of flexible online learning modules and intensive on-site workshops.

The *Emerging Leaders in Protected Cropping* program is well-underway at Western Sydney University's (WSU) Hawkesbury campus, with students participating in on-site workshops during the summer of 2020 and in April this year.

The workshops are part of the science and production-based units undertaken during the course. They focus on software and hardware systems; crop and produce management; integrated pest management; and fertigation systems. Practical activities were conducted in the laboratory as well as in the National Vegetable Protected Cropping Centre, which is a state-of-the-art vegetable glasshouse production research facility located on the Hawkesbury campus. Students also had to participate in discussion groups and present information on a particular topic or aspect of the unit.

Each workshop was held over two and a half days and are part of a blended learning program consisting of online lectures, tutorials and essential readings. During the lectures, students heard from a range of WSU experts and industry members such as Protected Cropping Australia (PCA) Chair Nicky Mann and PCA Deputy Chair Tony Bundock; Elio Jovicich from the Department of Agriculture and Fisheries, Queensland; Dion Potter from Syngenta; and Sun City Produce Managing Director Bao Duy Nguyen.

Other units to be undertaken throughout the Graduate Diploma (Protected Cropping) course include business and work integrated learning. The former comes from WSU's School of Business, to help growers understand those business components that they may not be familiar with. Work integrated learning involves students working within their own horticultural business or employer, or being matched with an industry business to provide hands-on problem solving. Their topic can be built around a research project, management questioning or marketing and branding.

Filling gaps

As reported previously in this publication, the protected cropping industry in Australia has been growing quite rapidly, at an average of around 4-5 per cent per year, which has resulted skills shortages.

WSU Senior Horticultural Education Officer David Randall explained that the main aim of this course is to provide a qualification that's never been offered before, and to provide the industry with locally trained, innovative experts in this field.

"Because that's what we don't have enough of in Australia. Many growers are using overseas consultants. They're paying a lot of money for people who don't understand our climate, our resource structures, and our pest and diseases. We really need local experts," David said.

It was the horticulture industry itself that identified these gaps, as David explained.

"This whole avenue of career development has been put forward by the university because the industry has been telling us for years that they need trained and qualified people.

"It has to have a framework that can recognise people's expertise. This course

Diploma graduate Elliott Akintola. Turn to page 49 to read more about Elliott's learning experiences.

has been born from industry engagement, and we have a reference panel of industry members that has helped us to develop these units and guide everything, from the topics that we cover to the assessment tasks. We're responding to the industry's call-out."

Growers and industry members interested in upskilling or gaining leadership skills are invited to enrol in the *Emerging Leaders in Protected Cropping* program, while employers are urged to support any prospective students.

"One of the pieces of feedback we've gotten is that the hours and the cost is quite substantial for an individual, and it's really beneficial to your employer for you to have that qualification and that extra training," David said.

"It takes the burden off the employer to have to train staff and, with employer support, the current crop of students are doing very well – and the overall feedback has been positive."

Find out more R&D

Please contact David Randall by emailing david.randall@westernsydney.edu.au.

Further details can be found on the Western Sydney University website: westernsydney.edu.au/future/study/courses/postgraduate/graduate-diploma-in-protected-cropping.html.

Emerging leaders in protected cropping is funded by the Hort Frontiers Leadership Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from Western Sydney University, Flavorite, Costa Group Holdings, Perfection Fresh, Australian Fresh Leaf Herbs, ICI Industries and contributions from the Australian Government.

Project Number: LP18000

hort frontiers Strategic partnership initiative | LEADERSHIP FUND

Opportunities for students

As its name suggests, the *Emerging Leaders in Protected Cropping* program is designed to train emerging leaders in the protected cropping industry.

There are three different elements to the program: The Graduate Diploma in Protected Cropping, which is available to those who have a bachelor's degree; the Graduate Certificate in Protected Cropping; and there are units being undertaken as a major in a Master of Science, majoring in Greenhouse Horticulture. The Graduate Certificate is half of the Diploma course and is designed for those who have an industry background and are looking to upskill.

Vegetables Australia spoke to three students who have been involved in the program – Elliott Akintola, Mamta Khadka Basnet and Claudio Cortellazzi. Turn to pages 48 to read about their experiences and what they have learnt as a result of their participation.

Gaining an insight into the protected cropping space

Mamta Khadka Basnet

Mamta Khadka Basnet (pictured above) recently graduated from Western Sydney University (WSU) with a Bachelor of Sustainable Agriculture and Food Security. Mamta enrolled in the Master of Science specialising in Greenhouse Horticulture after completing her degree, to understand about how greenhouse technology works for crop production.

"I am determined to study a degree based on protected cropping. With an ageing farmer population and climate change, I can see that the high-tech greenhouses could be the future of the agriculture. I like being in this industry because it plays a vital role in feeding the world. I love to be a part of a production system that has less environmental impact and is sustainable at the same time," Mamta says.

Mamta received a taste of working on-farm over eight months from September 2020. She wasn't able to attend the WSU Campus due to COVID-19 restrictions, so she says she used this situation to her advantage by applying for work at Costa Tomatoes in Guyra, which is located on New South Wales' Northern Tablelands.

"Costa grows tomato varieties in hi-tech glasshouses that span 30 hectares. I worked as a crop worker, plant health officer and a trainee assistant grower," she says.

For around two months as a trainee assistant grower, Mamta's duties included monitoring plant growth and health; identify common nutritional issues in the crop production and recommendations; and assisting with planning for the management of all tasks associated with crop production.

"Working at Costa was a very valuable experience for me. I had managed teams in my previous job but managing a team in a production industry was a completely different experience," Mamta explains.

"I learned how to monitor growth of the crop, quality control checks, water check, monitor and use mediums to control pests and diseases, and send daily and weekly reports on various topics to different stakeholders."

At the time of writing, Mamta was still in her first semester where she has completed units on greenhouse crop production and greenhouse control systems.

"Right now, I am actively applying for jobs in the industry. The knowledge achieved from this course will have a big impact when working in the industry, because whatever we learn is practically applied in all greenhouse industries."

Claudio Cortellazzi

Claudio Cortellazzi (pictured right) is currently studying a Master of Science, majoring in greenhouse horticulture. During his undergraduate studies, Claudio had undertaken units that were related to horticulture and protected cropping.

"I wanted to expand my knowledge and interest in protected cropping, so I decided to include those units in my degree," he explains.

"I have learnt a lot about protected cropping and agriculture so far, such as how greenhouses work; smart farming; and the use of sensors, and how they can be incorporated in a greenhouse as well as the different building materials and how they can affect the growth of plants.

"This course has increased my interest and given me good insight about what one could expect working in a protected cropping sector."

Prior to starting his Master course, Claudio wasn't aware of the wide range of job opportunities in horticulture. It was not until he attended one of the workshops that he saw what was available.

"The teaching staff are very supportive in terms of making students aware of scholarships and internships, and helping the students apply for them," he says.

At this stage, Claudio is focusing on completing his Masters, and in five years' time he is hoping to have a well-established career in protected cropping – perhaps even working abroad.

Claudio's advice for those who are thinking about undertaking the course is to "give it a go."

"The units are very well-structured and class sizes are small, making teacher to student ratio interaction very good. If you are coming from a non-agricultural background, the learning content is easy to grasp as the units are structured to ease you into the information and not overwhelm you from the start."

Acknowledgements R&D

Emerging leaders in protected cropping is funded by the Hort Frontiers Leadership Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from Western Sydney University, Flavorite, Costa Group Holdings, Perfection Fresh, Australian Fresh Leaf Herbs, ICI Industries and contributions from the Australian Government.

Project Number: LP18000

hort frontiers Strategic partnership initiative | LEADERSHIP FUND

Prioritising protected cropping in Australian agriculture

The protected cropping industry is one of the fastest growing agricultural sectors in Australia. In recognition of this, Western Sydney University, Hort Innovation and five industry partners are delivering the Graduate Diploma in Protected Cropping. In this edition, Diploma graduate Elliott Akintola speaks to Michelle De'Lisle about the course, what he learnt and how it applies to his nation-wide agronomy role at Garden City Plastics.

Can you please tell me about Garden City Plastics? What is your role in the business, and what does it involve?

Garden City Plastics (GCP) is owned and operated by an Australian family. With warehouses in all states and a manufacturing facility based in Melbourne, GCP is the largest plastic plant pot manufacturer for the horticulture and ornamental industry in Australia. Since 1975, the business has evolved to include the supply of horticultural products such as substrates/media, plant health and nutrition products, hardware and accessories to growers all across Australia.

I work in the company as an agronomist who provides tailored technical agronomic support to growers and customers. This can be for pest and disease, nutrition, weed management, Integrated Pest Management (IPM) and more. I am also responsible for overseeing the chemical range of the business, ensuring that the right plant health and protection products for our growers in the industry are carried within our range.

You recently completed your Graduate Diploma in Protected Cropping. Why did you decide to study this course?

Had you completed anything like this in the past?

I completed my Bachelor's degree in agricultural technology about a decade ago. Since then, I have worked across agricultural industries spanning two continents. My family background and roots are deeply connected to the principles and practice of agriculture. This gave me an awareness of the impact of agriculture on livelihood, the environment, and the economy. I know first-hand the issues surrounding food security and the collective effort needed to ensure sustainability.

Besides, it is estimated that world population will reach about 10 billion people by 2050 and it has been established that intense competition for resources such as land, water and energy would continue. Protected cropping provides an innovative and sustainable approach to meeting these needs and solving these challenges.

In Australia, protected cropping is the third fastest growing sector in agriculture and we must develop local talent and research to suit the climatic requirements and available resources. These issues and many more propelled me to specialise →

Elliott Akintola.

and build my professional understanding in the protected cropping field.

How did you hear about the course?

I heard about the course in October 2018 while at a Protected Cropping Australia grower tour at Western Sydney. During the tour, Professor Zhonghua Chen presented a tertiary study pathway, which included the Masterclass in Protected Cropping.

Attendees also had the privilege to tour the newly built state of the art National Vegetable Protected Cropping Centre, which is a high-tech glasshouse facility located at the Western Sydney University's Hawkesbury Campus. I was excited to see the level of investment the government, industry and the university had made into the facility and saw the advantaged practical implications of studying the course.

Personally, what were the course highlights?

It was a wide-ranging course that was rich in content, and there were many highlights. First was the research component – aside from the ability to utilise the latest technological tools and equipment for research, the course afforded the opportunity to investigate issues that are relevant and applicable in the industry.

The industry project component of the course was designed to enable students to partner with growers or stakeholders within the industry to explore a research topic. The unit alone helped to sharpen academic writing skills, project management skills, networking, and communication skills, to mention a few.

Distinguished academics delivered course units as well as growers who had both high- and low-tech production systems. They reflected on their practical experiences and the daily challenges. This ensured that there was a link between theory and practice, and visits to growers and research sites were included.

What did you take away from the course that you can apply to your role at Garden City Plastics? Is there anything that you can teach others in the workplace?

There are numerous lessons that I have taken away from the course that I apply daily, especially with providing agronomic support to GCP customers (growers) in the industry.

Through the course, I was able to have access to additional tools to apply in my role. These include pest and disease management, nutrition advice or developing recipes, evaluating biosecurity risks, or finding innovative approaches to improved business outcomes. This acquired training is also passed on to the field sales managers across the country as they interface with growers daily.

However, since GCP does not grow any plants, the course has helped me to clearly understand the intricate cause-and-effect of practices in the industry that would be detrimental to its growth. For instance, I had the privilege of evaluating the sustainability of the protected cropping industry in relation to the United Nations Sustainable Development Goals. Since GCP is the largest manufacturer of plastics to the industry, I am contributing towards the close looped recycling program and sustainability of plastics in the industry. Today, the pp5 recycling program is underway, especially in the ornamental industry.

How did you juggle full-time work with your studies? What tips would you have for other industry members who are thinking of studying while working?

Just like with any new project or idea or ambition, the first step is usually the hardest. But, with eyes on the goal, every subsequent step will be worth it. The excitement and acquisition of knowledge will spur any student to continue to commit to the study process.

In addition, having a good support system is critical. I work full- time and have a young family. Therefore, creating

a balance and relying on my support systems helped me get through the course. My family was understanding and made sacrifices to allow me to put in extra hours after work and on weekends to focus on my studies. My employer, GCP – particularly my supervisor Mathew Mills – encouraged me to pursue my passion for agriculture and learning. They made it possible for me to take leave from work to attend workshops and practicals at school, and conduct research with customers in the industry. Finally, the composite course delivery mode and the experienced and understanding tutors helped to ensure effective and successful learning.

Will you undertake any further education in the protected cropping space?

I am extremely excited about the protected cropping space and I will continue to learn, grow, innovate, and explore all that it has to offer in the Australian industry. I am currently enrolled in a Master of Science specialising in greenhouse horticulture. I aim to actively contribute to industry growth and continue to research the protected cropping space.

What's next for your career in the horticulture industry? Where do you see yourself in say, 5-10 years' time?

I plan to continue to consult and carry out research within the industry. In the next 5-10 years, I hope to investigate and find new innovative approaches to sustainable practices within the industry. I am currently researching topics around sustainability with an emphasis of inputs such as media in the Australian protected cropping industry. I may also have achieved a PhD, and made several discoveries that will propel the Australian industry to pole position in the world.

Would you recommend this course for horticulture industry members? Why/why not?

Yes, I would recommend this course to industry members and encourage businesses and stakeholders to support and sponsor their staff and other passionate young individuals to achieve this educational training and qualification.

The National Vegetable Protected Cropping Centre is a reputable facility that guarantees effective high-standard learning. With more skilled local talents, the industry can develop solutions that are built and modelled in Australia.

I was privileged to be awarded the COSTA Group Protected Cropping Scholarship for my graduate diploma program and this financial support was immensely helpful to achieve this qualification. I strongly encourage industry members to support the next generation to undertake this study and close the gap in skilled labour shortages.

I would also like to use this opportunity to thank all those that played a role in enabling me to achieve this qualification.

Acknowledgements R&D

Emerging leaders in protected cropping is funded by the Hort Frontiers Leadership Fund, part of the Hort Frontiers strategic partnership initiative developed by Hort Innovation, with co-investment from Western Sydney University, Flavorite, Costa Group Holdings, Perfection Fresh, Australian Fresh Leaf Herbs, ICI Industries and contributions from the Australian Government.

Project Number: LP18000

hort frontiers LEADERSHIP FUND


Alan Nankivell.

Tomato potato-psyllid in Australia: Yesterday, today and tomorrow

In October 2017, a project was launched with the aim in enabling the vegetable, potato and processing tomato industries to take a proactive and strategic approach to tomato-potato psyllid management in Australia. AUSVEG facilitated the three-year project, which was led by National Tomato-Potato Psyllid Coordinator Alan Nankivell. In this article, Alan reflects on the project's findings and results.

Yesterday

A strategic levy investment under the Hort Innovation Potato – Fresh, Potato – Processing and Vegetable Funds, *National tomato potato psyllid (TPP) program coordinator* (MT16018) was developed in recognition of the extensive impact the detection of tomato-potato psyllid (TPP) in Western Australia in February 2017. TPP was listed in the top 40 Australian exotic pests as well as the bacterium it vectors, *Candidatus* Liberibacter solanacearum (CLso).

TPP is the only known vector for CLso. This a phloem-limited, gram-negative, unculturable bacterium with five known haplotypes (A-E). CLso types A and B are associated with Solanaceae in Canada, United States, Mexico, Central America, New Zealand and Norfolk Island, while haplotypes C, D and E are associated with Apiaceae in Europe and wider Mediterranean region.

The impact of the CLso causes what is commonly known as 'zebra chip' markings in potato tubers. These are often not seen until processing into crisping and French fries, which results in unmarketable product.

Today

What became clear at the commencement of the project was the reluctance of growers to actively engage in reporting TPP if it was found. This was due to the potential for economic loss through biosecurity quarantine.

Secondly, industry stakeholders in the eastern states expressed concern that the 'just in time' nature of their potato tuber business was under threat from current quarantine practices if TPP was detected – whether they be ware, processing or seed, or moved across state borders daily.

The largest risk to their business was the imposition of state quarantine regulations that would stop the movement of potato tubers. The experience of stopping trade from Western Australia to the other states heightened this industry concern. These issues were required to be addressed promptly to ensure that business continuity was maintained.

The project worked extensively with stakeholders across the potato, vegetable and processing tomato industries. Within the potato industry, the project worked with all sectors of the supply chain from tissue culture, seed, tuber production and product to consumers. Government biosecurity agencies were an important stakeholder, especially regarding the economic impact of restricting the movement of product across state borders.

The project has successfully delivered:

- An increased knowledge of TPP and CLso.
- An Enterprise Management Plans for respective stakeholders.
- A National Management Plan for both industry and government stakeholders.
- An Industry Communique from Plant Health Committee (PHC) to the potato industry regarding the movement of potato tubers.
- A research and development plan for TPP and CLso.

Extension efforts were wide-ranging. As National TPP Coordinator, I engaged with potato, vegetable and processing and fresh tomato growers; potato processors; seed potato producers; potato tuber merchants; and respective industry bodies. This was achieved through 22 grower meetings that had a total of 455 growers in attendance; nine presentations at industry meetings and conferences, which approximately 400 participants attended; and three workshops conducted with industry and Plant Health Committee members. These were specifically on the movement of potato tubers.

A TPP Portal has been established where the resources mentioned above are available. This can be found on the AUSVEG website: ausveg.com.au/tpp.

Tomorrow

The outcome of this project has been increased government and industry preparedness for managing TPP and CLso, while importantly maintaining business continuity across Australia. This has been achieved using a strategic approach for the project – incorporating preparedness, building knowledge, and promoting surveillance and management techniques.

The project created the opportunity to increase Australia's capacity to ensure a smooth transition when new detections of TPP occur; thereby, increasing the chances of successful management through the development of on-farm management plans.

The strengthening and maintenance of a strong relationship between industry and government agencies has ensured business continuity throughout the supply chain. Management knowledge has been enhanced by the promotion of effective chemical and biological management strategies, effective use of surveillance tools, and ongoing community engagement and information dissemination.

It cannot be stressed enough the importance of maintaining industry-government relationships to ensure that the TPP Management Plan is continually reviewed and updated as new international and local evidence and technologies become available. This will improve the risk mitigation strategies currently in place.

A grower meeting in Western Australia facilitated by Alan Nankivell.

Find out more

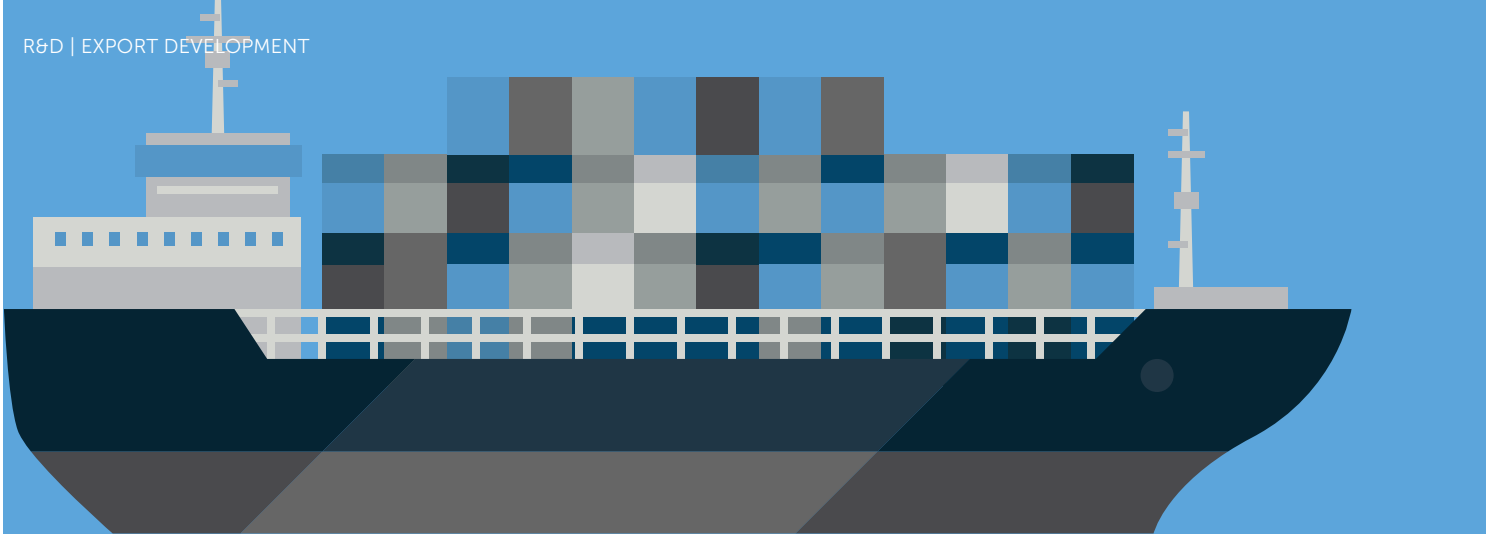
For more information, please contact AUSVEG National Manager – Engagement and Extension Zarmeen Hassan on 03 9882 0277 or email zarmeen.hassan@ausveg.com.au.

The final report will be made available on InfoVeg. Readers can search 'MT16018' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.

This project has been funded using the fresh potato, potato processing and vegetable research and development levies and contributions from the Australian Government.

Project Number: MT16018

Hort Innovation



2021 vegetable export update

Vegetable exporters have continued to supply international markets during for the first six months of 2021 despite experiencing market and logistical disruptions. Total vegetable export value has dropped 3.5 per cent to AUD$126 million and volumes are up two per cent to 127,783 tonnes compared to the same period of 2020. AUSVEG's Sam Turner reports.

Exports from January to June 2021

Total vegetable exports declined slightly in the first six months of 2021 compared to the same period in 2020. Based on data from the Global Trade Atlas, there was a slight decrease of 3.5 per cent in fresh vegetable export value, from $131 million to $126 million. Despite the decrease in export value, total vegetable export volume has increased slightly by 1.7 per cent, with an additional 2,101 tonnes shipped taking total export volume to 127,782 tonnes over the same period.

Australian vegetable exports started strongly in January 2021 as compared to the same period last year. March 2021 was the largest month for vegetable exports with export value of $24.1 million and export volume of 25,740 tonnes (refer to Figure 1).

Exports by destination and crops

The main export destinations for Australian fresh vegetable are ASEAN and the Middle Eastern regions. Singapore has recorded a slight decline in export value by 6.4 per cent from $24.7 million to $26.1 million and export volume remained consistent. The United Arab Emirates (UAE) experienced a dip of 10.7 per cent in value and a decline of 6.7 per cent in volume.

Malaysia rose 3.8 per cent in value and 21.8 per cent in volume. Thailand saw a modest uptick in trade volume by an average of 28 per cent and Taiwan experienced the largest increase in trade of the top export markets, with an increase in volume exported of 81 per cent (refer to Table 1).

The first half of 2021 continued to see root vegetables such as carrots, potatoes and onions shipping significant export volumes. Onion export volume recorded a 17 per cent increase of 5,458 tonnes compared to the same period in 2020. Beans have recorded a significant increase in export volume of 59 per cent and value increased by 38 per cent (refer to Table 2).

Outlook

While demand for Australian vegetables continues in a range of export markets, COVID-19 disruptions continue to impact vegetable exporters. Growers continue to face challenges with increases in freight costs, reduced freight capacity, inconsistent sailing schedules and difficulties in securing containers.

In addition to these challenges, growers are also facing rising input costs. Over the last few months, cardboard and packaging prices are increasing, along with other imported farm inputs. These expenses are on top of the labour shortages due to international travel restrictions and the increased regulatory charging regime for export certification that commenced on 1 July 2021.

What's next?

A strategic levy investment under the Hort

Figure 1

Change in vegetable exports by month – January to June 2020-2021.

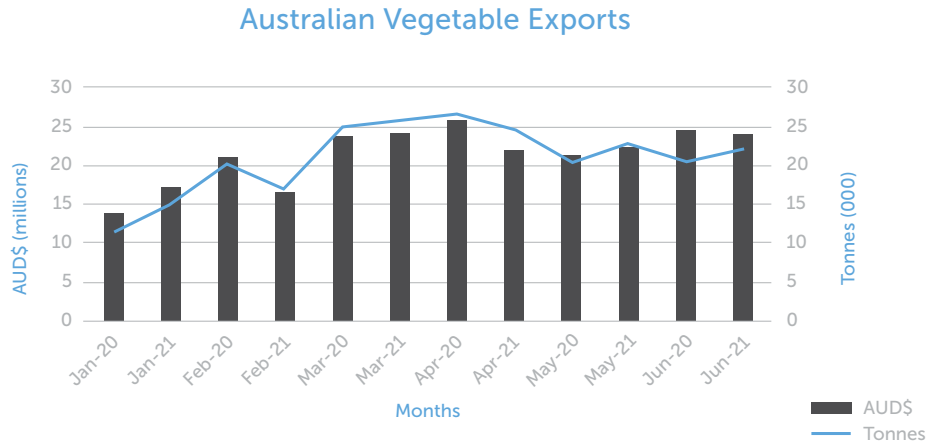


Table 1

Change in vegetable exports by destination market January to June 2020-2021.

Trade Partner	2020		2021		% ▲	
	AUD$	Tonnes	AUD$	Tonnes	AUD$	Tonnes
Singapore	$24,678,543	14,107	$23,102,908	14,038	-6.4%	-0.5%
United Arab Emirates	$17,608,015	18,857	$15,718,961	17,594	-10.7%	-6.7%
Malaysia	$14,401,381	13,205	$14,941,558	16,081	3.8%	21.8%
South Korea	$7,910,476	13,099	$10,202,384	16,660	29.0%	27.2%
Hong Kong	$8,908,372	4,979	$8,424,120	4,386	-5.4%	-11.9%
Thailand	$6,642,331	7,146	$6,690,507	9,214	0.7%	28.9%
Saudi Arabia	$7,479,762	8,431	$6,678,181	7,480	-10.7%	-11.3%
Qatar	$6,186,557	6,035	$4,749,516	4,824	-23.2%	-20.1%
Taiwan	$3,311,871	3,421	$4,523,232	6,188	36.6%	80.9%
Philippines	$4,346,515	7,178	$4,270,624	7,190	-1.7%	0.2%

Table 2

Change in vegetable exports by crops January to June 2020-2021.

Trade Partner	2020		2021		% ▲	
	AUD$	Tonnes	AUD$	Tonnes	AUD$	Tonnes
Carrots	$44,950,488	50,397	$43,019,945	49,271	-4%	-2%
Potatoes	$24,241,214	32,686	$22,420,507	30,759	-8%	-6%
Onions	$25,538,643	31,492	$24,798,346	36,950	-3%	17%
Broccoli & Cauliflower	$7,649,825	1,696	$6,602,975	1,315	-14%	-22%
Celery	$4,318,905	2,494	$4,296,028	2,382	-1%	-4%
Lettuce	$4,120,980	554	$3,883,513	499	-6%	-10%
Beans	$1,664,033	276	$2,292,243	439	38%	59%
Pumpkins	$3,284,266	1,619	$2,403,725	1,727	-27%	7%

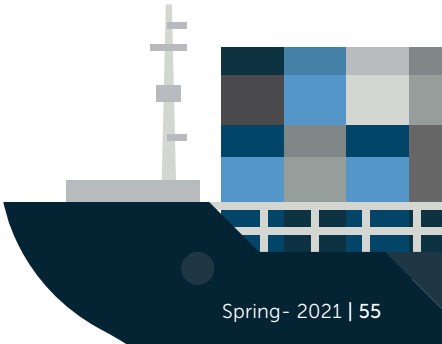
Innovation Vegetable Fund, the *Vegetable Industry Export Program* (VG16061) concluded on 30 June 2021.

AUSVEG wishes to acknowledge all exporting vegetable producers, Austrade, the Department of Agriculture, Water and the Environment and various other project partners that contributed to the successful delivery of VG16061.

Development of the next iteration of the vegetable industry export program is currently underway. In the meantime, AUSVEG strongly encourages all exporting growers to continue to engage with the AUSVEG Export Development team to discuss any international trade-related matters.

Find out more R&D

Growers interested in identifying export events, or who would like to discuss export opportunities, can contact the AUSVEG Export Development team on 03 9882 0277 or export@ausveg.com.au.




Syngenta Portfolio Lead Scott Mathew.

Managing fungicide resistance keeps future options open

Controlling certain diseases in vegetable crops can be difficult should resistance to fungicides occur. In this column, Syngenta Portfolio Lead Scott Mathew explains a strategy that can be undertaken to reduce the risk of resistant pathogen survival and delay the resistance process in medium and high-risk crops.

When it comes to the longevity of various fungicides, we all have a part to play. But there are some very practical steps that vegetable growers can adopt on the farm, starting with the use and rotation of different fungicide mode of action groups. This helps ensure we can keep as many options available to growers well into the future.

Certain fungi can become resistant to different fungicide groups over time; therefore, reducing their effectiveness in controlling the disease. In any fungal population, there are likely to be some individuals that have a degree of natural resistance, making them less susceptible to fungicides (refer to Figure 1).

The continual use of a fungicide, or fungicides from the same mode of action (MoA) group, can lead to an increase in the number of resistant individuals and can result in the fungicide becoming ineffective against the target disease. For this reason, CropLife Australia has put in place fungicide resistance management strategies for medium-to-high risk crops and diseases.

If growers utilise all of their available management strategies and follow the CropLife fungicide resistance management strategies, it will reduce the risk of resistant pathogens surviving and multiplying, and help to delay the onset of fungicide resistance development.

Mode of action explained

Fungicides are classified according to the chemical activity group, or MoA, which refers to the specific stage of the disease cycle they target.

Some fungicide MoA groups and diseases have a higher risk of developing resistance than others. As such, CropLife Australia has a recommended resistance management strategy for these groups or for particular crops and diseases.

Different fungicide group numbers allow growers to know which fungicide MoA group they have used, and makes it easier to follow resistance management strategies for that crop and disease.

Syngenta has MIRAVIS® Prime – which is a combination of Group 7 and 12 – available for lettuce and leafy vegetables, berries, potatoes and table grapes.

MIRAVIS® Prime combines two modes of action for powerful, long-lasting control of disease, and as a management tool to help delay the onset of resistance.

This will become a key product in helping growers to achieve quality produce with excellent control of powdery mildew, sclerotinia and botrytis – but should not be relied upon as the sole fungicide option.

By following the fungicide resistance management recommendations of CropLife, growers can help ensure the range of products that are currently available are here in the long-term.

It's not enough to rotate products. It is essential to identify the fungicide groups you are using and rotate between different modes of action. Over-reliance on those groups that are deemed high-risk will hasten the development of resistance.

There are many instances throughout the world where the overuse of products has seen fungal pathogens rapidly become resistant to some mode of action groups. By rotating chemistry, following guidelines and label directions, growers can take care of the products currently available and ensure they are viable well into the future.

Figure 1:
How resistance develops

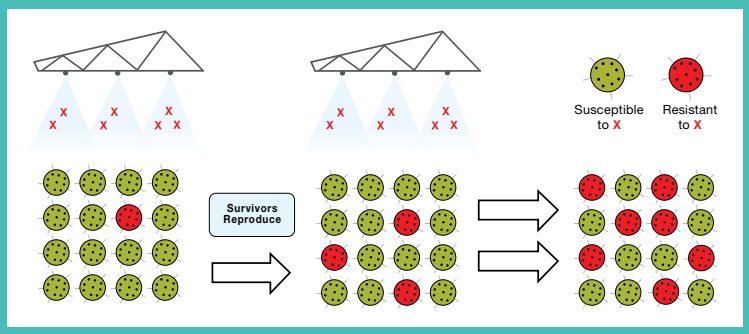
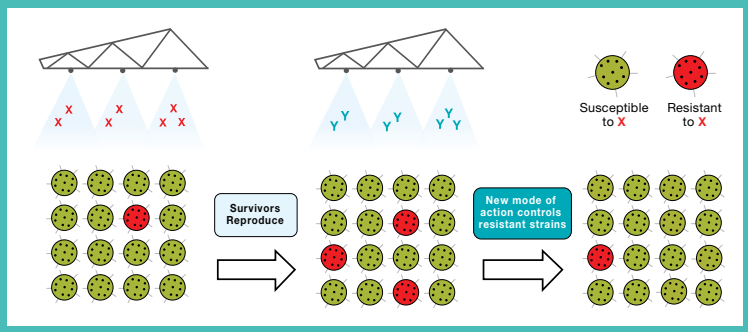


Figure 2:
Rotating Modes of Action (MoA) slows down resistance development.



Find out more

Please visit syngenta.com.au/miravis-prime.

Dr Cherie Gambley.

Typical symptoms of phytoplasma in capsicum.

Vector monitoring and disease identification activities continue

A multi-million-dollar project responsible for developing an 'area wide management' strategy commenced in 2018 to address high-priority viral and bacterial diseases affecting vegetable crops. Project Lead Dr Cherie Gambley from the Department of Agriculture and Fisheries, Queensland, provides an update.

Area Wide Management of Vegetable Diseases: viruses and bacteria (VG16086) is a strategic levy investment under the Hort Innovation Vegetable Fund. This 4.5-year project includes co-investment from multiple partners, and is supported by another specifically-focused project led by the New South Wales Department of Primary Industries and similarly funded by Hort Innovation.

Project discoveries

Key findings from the last year include new information about seasonality of viruses, bacteria and insect vectors and their geographic importance. In Queensland, there were significant outbreaks of *lettuce necrotic yellows virus* in lettuce crops in the Lockyer Valley over the autumn/winter 2020 season. This followed on from impacts of other aphid-spread viruses of brassicas in the district towards the end of 2019.

In Victoria, a significant outbreak of *cucumber mosaic virus* occurred in spinach and a new *Polerovirus* sp. was detected in parsley. For South Australia, *ranunculus white mottle virus* incidences above 80 per cent were detected in some capsicum crops, indicating this virus continues to cause sporadic concerns for that district.

In Western Australia's Perth district, *carrot virus Y* caused disease outbreak in carrot crops; whereas in the Northern Territory, viruses affecting sweetpotato were of most interest. The thrips-transmitted tospoviruses continue to be of national importance with regular detection of viruses in all jurisdictions except in the NT, which remains free of these viruses. The potyviruses causing mosaic disease in cucurbits crops also continue to be a concern nationally.

For bacterial diseases, the key findings were improved knowledge on the detection and identification of phytoplasmas affecting vegetable crops and is the focus of this article. Additionally, was the detection of *Pectobacterium* sp. affecting zucchini in several states. This has prompted further investigations of the disease through glasshouse and field trials.

Vector monitoring activities in QLD continue to clarify the key weed hosts for thrips in the dry tropics and seasonality of both western flower thrips and tomato thrips. This monitoring was also completed in Bacchus Marsh in VIC and Carnarvon, WA. The 2020 incidences of the *tomato spotted wilt virus*, spread by these thrips species, varied with very high levels observed in VIC and very low levels in QLD. This highlights the importance of considering all factors in disease outbreaks caused by insect-vector viruses, and not just thrips numbers alone.

Due to COVID-19 restrictions, industry engagement was limited to webinars and one-on-one discussions with growers or consultants where possible. Multiple factsheets were prepared and distributed during the year on disease outbreaks and options for their management. Factsheets on key exotic threats were also prepared for publication by Plant Health Australia. These included exotic begomoviruses affecting cucurbit and solanaceous crops, exotic tospoviruses and tobamoviruses affecting vegetable crops, Stewart's wilt of corn (*Pantoea stewartii* subsp. *stewartii*) and *Erwinia trachephila* bacterial wilt of cucurbits.

Case study: Phytoplasma diseases of vegetables

Phytoplasmas are small bacteria that only multiply within their insect vectors or the phloem of plants, which is responsible for transporting food and other organic materials throughout the plant. They cause a variety of symptoms in their plant hosts, and typically affect development of floral parts, leaves, roots and/or branches. This includes the conversion of flowers into leafy tissue (phyllody), the greening of petals (virescence), and aborted →

Dr Anthony Rice.

PhD student Bianca Rodrigues Jardim pictured in the laboratory. Images courtesy of Dr Cherie Gambley.

fruit development.

Other typical symptoms include little leaves, leaf yellowing, witches'-broom, stunting, and aerial roots or tubers. Phytoplasmas can compromise the plant's survival and directly affect crop yield.

Potato purple top, tomato big bud, and brinjal little leaf are among the most widespread phytoplasma diseases causing economic impacts to vegetable crops globally, with reports of 40 to 100 per cent yield losses.

The phytoplasma subgroup 16SrII-D phytoplasmas, or '*Candidatus* Phytoplasma australasia' is thought to be the major species affecting vegetable crops in Australia. The disease is commonly called tomato big bud, and affects a broad range of vegetable crops including celery, capsicum, tomato, papaya, cucurbits, carrot, lettuce, eggplant, snake bean, potato and alfalfa.

In Australia, sporadic outbreaks can occur anywhere, and can cause significant economic impacts. For example, during the summer 2016-17 season within the Granite Belt growing district of QLD, impacts to solanaceous crops from phytoplasma resulted in economic losses of $3,300 to $35,200 per hectare for tomato, $12,685 for eggplant and $1,400 for capsicum. Impacts to vegetable crops were widespread during that season, affecting most of Australia's east coast.

Phytoplasmas are spread from one plant to the next by phloem-feeding insects such as leafhoppers, planthoppers, and psyllids, but can also be transferred through grafting of infected stock. Phytoplasmas can come into vegetable crops from environmental sources such as weeds and native plants that may not always show symptoms. It is likely seasonal patterns, such as rainfall, is an important factor influencing when outbreaks occur.

Further research was needed in Australia to better understand the diversity of phytoplasmas present, the insects responsible for spreading them and what the likely triggers are that drive outbreaks.

Managing phytoplasma disease in veg

In collaboration with Dr Anthony Rice from Granite Belt Integrated Pest Management, our QLD- based project team has made great progress in identifying potential leafhopper vectors in the Granite Belt district. Regular monitoring for phytoplasma and leafhoppers in crops started in the 2019-2020 summer season and continues. During the 2020-2021 summer season, the investigation was expanded to include a range of environmental plants that potentially harbour the leafhoppers and the phytoplasma. Disease incidence during the 2019-2020 season was low, as were leafhopper numbers. By contrast, 2020-2021 saw higher numbers of both, with leafhopper numbers peaking in November and disease in late December and January.

From the leafhopper collections, at least four potential vector species were found. These were *Orosius argentatus, O. orientalis, O. canberrensis*, and *Austroagallia torrida* and from environmental plant surveys, blue heliotrope (*Heliotropium amplexacaule*) had the most leafhoppers. Further work on the insects and blue heliotrope are needed to understand their roles in disease outbreaks. This will ultimately inform management strategies.

Within the project, we also have Bianca Rodrigues Jardim, who has commenced her PhD studies aimed at using whole genome data of the phytoplasmas found in vegetable crops to investigate their diversity and biology. Bianca is a student within Agriculture Victoria Research's School of Applied Systems Biology (SASB) at La Trobe University in Melbourne.

Samples for her study have come from vegetables, weeds, and insect vectors from growers, consultants, and nurseries in addition to the VG16086 team. This approach has provided a large number of samples across a wide geographic area around Australia for at least three years. The PhD aims to explore the species and genetic diversity of these phytoplasma with a higher accuracy than before by using whole genome data, rather than the gene-by-gene approach.

Bianca will focus on the biology and genetic diversity of the dominant vegetable-infecting phytoplasma subgroup

Resources available to growers

The Area Wide Management project team has produced the following factsheets, which have been published on the Hort Innovation website:

- Area wide management of viral and bacterial diseases of vegetables.
- Prioritised list of viral and bacterial diseases of vegetables.
- Viruses infecting brassicas.
- Virus diseases of cucurbits in Australia.
- Managing virus diseases of zucchini.
- Lettuce necrotic yellows virus in the Lockyer Valley.
- Aphids spreading virus in brassicas and lettuce in the Lockyer Valley.

These can be found at: horticulture.com.au/growers/help-your-business-grow/research-reports-publications-fact-sheets-and-more/vg16086.

in Australia, '*Candidatus* Phytoplasma australasia' (tomato big bud). The case study will concentrate mostly on the Granite Belt area to support broader project research in that district and the intensive sampling will provide the greatest gains for her study. She aims to use the genetic data to infer the movement of phytoplasmas in an area, identify environmental hosts, and help understand what drives differences in symptomologies within a plant species.

Further work

Monitoring will continue in the Granite Belt with a focus on finding over-wintering plant hosts that allow survival of the leafhoppers and/or phytoplasma between cropping cycles. Crop surveys will recommence during the next summer season. Once environmental sources of phytoplasma can be identified, methods to reduce or eliminate then can be determined and/or trialled.

Bianca will continue her studies with developing methods to improve whole genome sequencing of phytoplasmas, apply whole genome data to identify markers that would be useful in taxonomy of closely related phytoplasmas, and to update the list of phytoplasma species detected in vegetable crops across Australia along with their associated symptoms.

Find out more R&D

Please contact Dr Cherie Gambley on 0423 200 211 or email cherie.gambley@daf.qld.gov.au, or email Bianca Rodrigues Jardim at bianca.rodriguesjardim@agriculture.vic.gov.au. Private Research Collaborator Dr Anthony Rice can also be contacted via email at ant@granitebeltipm.com.au.

This project has been funded by Hort Innovation using the vegetable research and development levy, co-investment from the Department of Agriculture and Fisheries, Queensland; Victorian Department of Economic Development, Jobs, Transport and Resources; the Northern Territory Department of Primary Industry and Resources; the Western Australia Department of Primary Industries and Regional Development; and the University of Tasmania and contributions from the Australian Government.

Project Number: VG16086

Hort Innovation Strategic levy investment | VEGETABLE FUND

A trial at Werribee South explored the decision-making processes of Fresh Select along their precision agriculture journey.

Delivering during tough times: A look back on VegNET – Victoria Phase 2 highlights

Now that we have reached the end of the second phase of *VegNET – Victoria (South-East, West and Northern Regions)*, Regional Development Officer Dimi Kyriakou revisits some of the project's achievements over the past 18 months.

As I write this column during yet another lockdown in Victoria, it's an uncomfortable reminder of the disruptions that our state's vegetable industry has had to endure in recent months (as well as our colleagues interstate). While each growing operation has been affected differently throughout the pandemic, Victoria's vegetable industry has once again demonstrated that resilience runs in the veins of every grower.

This has been buoyed by a demand for fresh produce, particularly in Victoria, where consumer insights from Nielsen showed a surge in vegetable sales as the 'new normal' correlated with eating more food at home and trying new recipes with fresh produce as their centrepiece.

Needless to say, the frequent lockdowns in Victoria over the past 18 months meant that we haven't been able to visit growers on-farm as much as we would have liked. However, we continued delivering events online, developing resources and sharing information on relevant research to help growers address their priority issues, with some highlights from the project listed below.

Regional Extension Strategy

Phase 2 kicked off with the development of a five-year Regional Extension Strategy to address the priority issues of Victorian growers, which include water, profitability, pests and diseases, soil and nutrition management, and precision agriculture. The strategy takes a deep dive into three areas in particular:

- **Water** – soil moisture monitoring and retention.
- **Profitability** – resource use optimisation.
- **Pest and disease management** – native vegetation insectaries.

Ongoing engagement with researchers and services providers – delivering a range of levy-funded projects – were linked to growers, with a particular focus on the EnviroVeg self-assessment

program and projects focusing on peri-urban surveillance and diagnostics, area wide management of insect-vectored viral and bacterial diseases in vegetables, biosecurity, the iMapPESTS sentinel and Soil Wealth and Integrated Crop Protection.

Managing irrigation requirements over the Victorian summer

As the weather starts to heat up, this webinar recording with Dr Kelvin Montagu from the Soil Wealth and Integrated Crop Protection team explains what is needed to accurately monitor soil moisture and how this information can be used to benefit your irrigation practices.

Access the webinar: ausvegvic.com.au/crop/managing-irrigation-requirement-using-soil-moisture-monitoring.

Compost calculator – knowing the value of organic amendments in your Victorian vegetable nutrition program

The addition of organic soil amendments is becoming increasingly popular in vegetable production. Organic amendments provide a range of benefits to farming systems from both a production and economic perspective.

A project being delivered by Queensland University of Technology, in collaboration with La Trobe University, is seeking to provide growers and industry service providers with an effective decision support tool to integrate organic amendments into farm nutrient budgets.

Access the webinar to hear from the research team: ausvegvic.com.au/topic/compost-calculator-knowing-the-value-of-organic-amendments-in-your-vegetable-nutrition-program-in-victoria.

Translating precision agriculture data at Fresh Select

Fresh Select is one of the largest lettuce and brassica growers in Australia. As a leader in innovation, sustainable farming techniques and responsible practices, it has also been one of the first to trial precision agriculture technology in vegetables.

Precision agriculture refers to technologies that improve productivity by considering the variability of agricultural land and crop growth at sub-farm, row or plant scale. Also known as 'site-specific crop management', precision agriculture can ensure the right crop management strategies are implemented in the right place at the right time.

In Victorian vegetable production, precision agriculture is in its early days and the details of when, why and how precision technologies may be best used in horticulture are still open to interpretation. This case study explores the decision-making processes of Fresh Select along its precision agriculture journey.

New resources including native vegetation insectaries updates

At the time of writing, we were in the process of developing new resources for Victoria's vegetable growers as well delivering additional events and webinars. This includes updates on the native vegetation insectaries plantings in Werribee South.

A refreshed factsheet on what native vegetation insectaries are and how they can benefit vegetable growers can be found here: ausvegvic.com.au/crop/native-vegetation-insectaries-permanent-habitat-for-beneficial-insects.

Check out the 'Resources' section of the AUSVEG VIC website for the latest updates from VegNET Victoria at ausvegvic.com.au/resources.

Stay updated

- If you're on Twitter, make sure you follow us at @GrowingVegBizs.
- Subscribe to the Regional Update e-newsletter for the latest resources and links to useful information. If you would like to receive the Regional Update, please send your email address to dimik@rmcg.com.au and we'll add you to the list.

The EGVID team (L-R): Kate Grigg, Bonnie Dawson, Stuart Grigg, Noel Jansz and Daniel Hammond. Absent: Andrew Bulmer and Jody O'Brien.

EGVID2020 recognised for R&D adoption and industry impact

VegNET – Victoria was proud to sponsor the R&D Adoption and Industry Impact Award for the fifth year at the 2021 AUSVEG VIC Awards for Excellence, having developed the award back in 2016. The award highlights the important role of research and development (R&D) in supporting the profitability, productivity and sustainability of the vegetable industry.

Congratulations to the team behind the East Gippsland Vegetable Innovation Days (EGVID) 2020, who received the Victorian award as well as the national accolade at Hort Connections 2021.

Spanning over two hectares, the EGVID demonstration site showcased more than 20 vegetable crop types and around 2,000 varieties ranging from lettuce and baby leaf varieties to broccoli, cabbage, cauliflower and more. A series of videos capturing the extensive trial site can be accessed on the AUSVEG website at ausveg.com.au/innovation-days-search.

You can also hear from past R&D Adoption award winners such as Andrew Fragapane (Fragapane Farms) and Mark and Darren Schreurs (Peter Schreurs & Sons) at ausvegvic.com.au/communication/video-2.

Find out more R&D

Please contact VegNET – Victoria Regional Development Officer Dimi Kyriakou on 0488 124 626 or email dimik@rmcg.com.au.

VegNET – Victoria (South-East, West and Northern Regions) 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

John Darcy from the Victoria Farmers Federation speaks to forum attendees about the 'Making Our Farms Safer' project. Images courtesy of Bonnie Dawson.

Workforce focus for VegNET – Gippsland

VegNET – Gippsland's commitment to increase workforce capability has been in overdrive in 2021, with forums taking place to highlight the opportunities available. It has also been working with Food & Fibre Gippsland's employment program to connect horticultural businesses and trainees, as well as supporting school leavers in their new role. VegNET – Gippsland Regional Development Officer Bonnie Dawson reports.

Food & Fibre Gippsland's employment program (Connect2Employment), Central Queensland University's Raising Aspirations in Careers and Education – Gippsland (RACE – Gippsland) program, TAFE Gippsland and Agriculture Victoria, recently banded together to support Gippsland's growers in attracting, retaining and looking after their employees.

Initially, an in-person forum was held in Sale and the second event was moved online. It's now available to view as a recording and will be summarised into a factsheet.


Tilly Gunther.

The forum was also used as an opportunity to collaborate with the Victorian Farmers Federation's (VFF) 'Making Our Farms Safer' project. John Darcy represented the initiative, and he spoke about the important topics of workplace manslaughter and farm safety.

John's presentation reinforced the importance of farm safety for everyone – but particularly business owners, company directors and officers, to which Worksafe's new Workplace Manslaughter Laws now apply. The group also heard about VFF's Making Our Farms Safer team that can provide free farm safety consults for individual businesses to establish and review their OH&S processes.

Workforce focus

The forum was an opportunity for Agriculture Victoria to provide an update about the support available to growers in the lead-up to what is expected to be another challenging year for seasonal workforce requirements.

Programs specifically available in Gippsland include the RACE program, which is designed to raise the awareness and aspirations of young people in Gippsland to pursue a career in agriculture by connecting school students and teachers with industry. Food & Fibre Gippsland is a partner of the program and has already successfully established connections between the program and some of Gippsland's largest growers, who will be hosting teachers for professional development sessions in September.

TAFE Gippsland Head of Rural Sciences, Forestry and Maritime, Bruce Macpherson presented about the traineeships and short courses that the TAFE can offer industry, while Food & Fibre Gippsland's Connect to Employment (C2E) Program Manager Julie Tuhi gave an overview about how the program can support both growers and jobseekers to find appropriate employment.

For further information or to be put in contact with the aforementioned programs, please contact VegNET – Gippsland Regional Development Officer Bonnie Dawson on the details below.

Paving a pathway for school leavers

A week after finishing year 12 in late 2020, Tilly Gunther was employed as a trainee at Bulmer Farms, one of Australia's leading baby leaf growers based in East Gippsland's Lindenow Valley.

Tilly's leadership and communication skills impressed, and Bulmer Farms Human Resources Manager Karen Grant was quick to offer her a traineeship in the quality department.

"We are always interested in talented, enthusiastic young people – and we love it when we can offer local school leavers the option to pursue a career in the region," Karen says.

One of the many great things about entering the industry via a traineeship is the trainee gains a strong insight into other areas of the business, while acquiring some valuable transferrable skills.

The traineeship is offered in collaboration with Food & Fibre Gippsland's Connect 2 Employment (C2E) Program, which is supported by the State Government's $619.4 million Jobs Victoria initiative.

Gaining hands-on knowledge

Over an 18-month tenure, Tilly will learn about every element of the extensive quality systems that ensure the best produce leaves the Lindenow packing shed.

While other teenagers might be sleeping in, Tilly is an early starter – she is with the Bulmer Farms' quality team on-site at 5am, ready to test the fresh picked harvest and prepare all the necessary documentation to accompany each dispatch of boxed baby leaf.

"I'm finished by 1pm most days, meaning I've got the time and space to be able to do what I want for the rest of the day – it's fantastic," Tilly says.

To support trainees, C2E can cover the costs of all uniforms, safety gear and work boots, as well as fund any external training courses identified by the employer as beneficial for the new employee.

"We're here to support trainees in many ways. Saving them money on the workwear necessities is a big thing, and we work hand-in-hand with the employer to keep track of how they're settling into the workplace," C2E Program Manager Julie Tuhi says.

"This access to an external mentor is really valuable – it all contributes to maximising their job satisfaction and success, which ultimately leads to the opportunity for long-term employment."

Further information

Traineeships are offered in the horticulture industry at various times throughout the year, and can cover a variety of areas, including production, maintenance and growing operations.

If you are a Gippsland grower and would like to explore traineeship opportunities, please get in touch with Julie via email at julie.tuhi@foodandfibregippsland.com.au or call 0448 880 824.

Tilly is one of 27 workers from four of Gippsland's largest vegetable growers – Bulmer Farms, Flavorite, Schreurs and Sons, and Hussey & Co – who have been profiled in Food & Fibre Gippsland's *This Is My Job* video series, which has been shared across social media. The videos can be found here: foodandfibregippsland.com.au/this-is-my-job.

To find out more, please contact VegNET – Gippsland Regional Development Officer Bonnie Dawson from Food and Fibre Gippsland on 0407 683 938 or email bonnie.dawson@foodandfibregippsland.com.au.

VegNET – Gippsland 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

Windrow turning the compost. Images courtesy of Simone Cameron.

Unearthing NT Soil Wealth

The Phase II VegNET – Northern Territory Regional Extension Plan found an identifiable gap in grower awareness and understanding of NT soils. *Unearthing NT Soil Wealth* became one of the five key focus areas to promote regionally over the rollout of the 2020-2025 Regional Extension Plan, with over 1,500 hectares across the Top End dedicated to vegetable production annually.

The Northern Territory's soils are a variable mixture of Kandosols, Tenosols, Rudosols and Vertosols; all of which are known to have limiting factors for horticultural production.

A grower survey highlighted that over 90 per cent of producers in the Northern Territory acknowledge that they have a lack of understanding on soils and the influences that good soil management practices could have on productivity. There has been a significant amount research, development and extension completed on soils in the southern areas of Australia, with little to very little emphasis or focus across the Top End.

A greater understanding on soil and its plant interactions represents a huge opportunity to produce immediate gains with on-farm productivity and profitability. As the Northern Territory vegetable industry continues to expand, there is an ongoing need to support new and existing growers to help the industry grow and be sustainable into the future. This can be achieved through demonstrating and modelling current best practice models as well as through valuable extension activities.

Local trials

In collaboration with the Territory Natural Resource Management's NT Soil Consortium, the Unearthing NT Soil Wealth project has helped to conduct a local compost trial comparing a conventional turn with a fermentation composting method. This is established and conducted on an organic farm in Darwin's rural area.

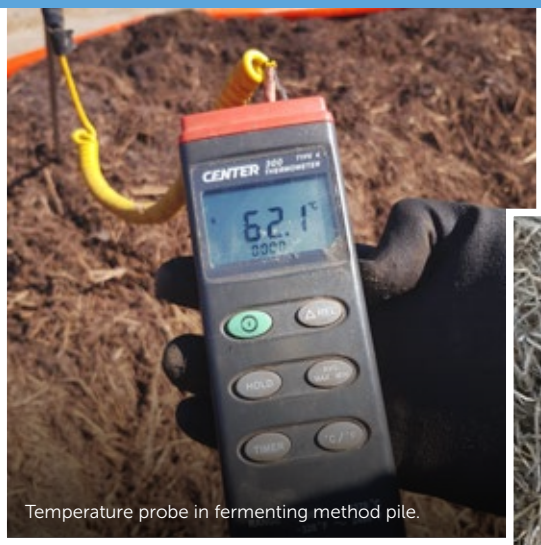
VegNET – Northern Territory Regional Development Officer Simone Cameron has been supporting the Northern Territory's Regional Agricultural Landcare Facilitator, Emily Hinds, with conducting this trial. Local organic grower Bluey Stoldt has engaged in hosting the trial at his seasonal vegetable production farm, Organic Ag.

Bluey has been a passionate advocate for composting and has been practicing the art of compost making for many years. The current method he uses is the conventional, aerobic method that requires constant turning to aerate the row. This also requires regular use of a machine, attachments and water at each turn, increasing the costs of the product through fuel, labour and water.

Bluey has not trialled the fermentation compost method before, which involves the use of an inoculant and requires reduced inputs in terms of water and physical intervention. He is keen to see the end of the trial to compare the end compost product analysis.

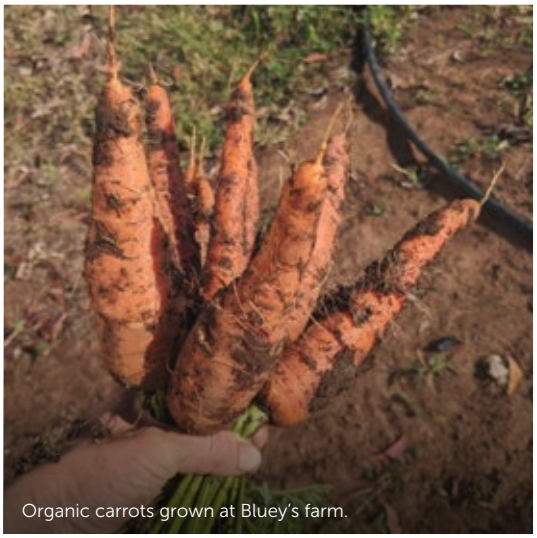
If the fermentation method results with a comparable or better compost product to his usual method, it represents a big opportunity to reduce input costs to the product, and importantly for Bluey more time for farming.

"I love making compost and as an organic farmer, it's a really critical part of our soil management and nutrition. If this (fermentation compost) works out I'm very excited about it. It means less water and



Temperature probe in fermenting method pile.


Bluey Stoldt's soil after composting.


Organic carrots grown at Bluey's farm.

fuel, and all the time I'll gain," Bluey says.

Objectives and next steps

The aim of the trial is to demonstrate the benefits of composting to soil health and fertility through the utilisation of regionally available resources and ingredients, as well as appropriate methods and inputs required for composting.

It also aims to demonstrate to producers the benefits of considering their soil to be one of their most important farm assets, and how efforts to improve soil can made simply by adding compost.

On completion of the trial, a one-day composting on-farm workshop will be held. This will be open to interested producers, farmers, horticulturalists and industry stakeholders, and will include a visit to the trial site to observe the equipment, ingredients and final products.

Agro-ecologist David Hardwick from Soil Land Food, one of Australia's leading soil extension specialists, is overseeing the trial and will be presenting and delivering the workshop summation.

Supporting growers

In her role as the NT's Regional Agricultural Landcare Facilitator, Emily Hinds believes that practical demonstrations of this type are so important for encouraging the industry to take up positive soil management techniques and implement practice change.

"If they can see and hear from their neighbours about what is involved, observe the set up and machinery – and then be there at the end to feel the compost and the soil after application – I think it goes a long way to increasing positive, sustainable soil management practices," Emily says.

The workshop will demonstrate the benefits of adding compost to the soil, such as increased soil fertility and reduce erosion risks, which Emily says is important for the Top End's generally poor fertility soils and high rainfall events in the wet season.

Emily and Simone have supported Bluey with regular visits to his farm to check on the trial, provide contacts for information and ingredients and more importantly, deliver a lunch order for him from town on one of their visits!

If local producers don't have the means to create their own compost, the collaboration and networking that occurs at these events opens further opportunity for sharing. This is something Bluey thinks would be beneficial.

"If I wasn't farming, I'd be making compost. A lot of people are interested in buying it, but I never have enough," he says.

At the time of writing, the workshop day has been scheduled to run twice. Unfortunately, it has been postponed on both attempts due to the ongoing uncertainties of COVID-19 and the travel restrictions imposed across the country.

It is hoped that this event will be delivered in August through a hybrid model. It will culminate in a proposed Soil Symposium Day to be rolled out across three regions in the Northern Territory: Darwin, Katherine and Alice Springs. This will occur in early September.

With the original workshop capped at 40 registrations, it demonstrates the desire for our Top End producers to know more about their precious asset and resource – soil.

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

Drone applying UV paint on a greenhouse. Images courtesy of the Soil Wealth Integrated Crop Protection project.

Update from the Wide Bay-Burnett region

The VegNET – Wide Bay-Burnett project continues to deliver local trials and workshops to vegetable growers across the region, which spans hundreds of kilometres north of Brisbane. VegNET – Wide Bay-Burnett Regional Development Officer Bree Grima provides a summary.

The Wide Bay-Burnett region has remained relatively open for business throughout the COVID-19 pandemic, and our thoughts are with the regions heavily impacted by lockdowns.

While it's been business as usual, producers have been impacted by the rising cost of inputs and labour shortages – placing continual pressure on the bottom line. As Regional Development Officers, we often find ourselves in a counselling position by accident and support can take many forms during these challenging and changing times.

This could simply be an ear to listen to, providing information from the latest R&D to assist with increasing productivity and profitability, or providing the link between grower and researchers to ensure research is focused on commercial applicability.

A hive of activity

The Wide Bay-Burnett region has had an influx of trials and workshops in the past couple of months.

A recent workshop was held for a small group of growers to provide practical information on the best times to apply systemic and non-systemic products, and how they affect the plant at various growth phases. This was well-received by attendees.

We have seen ag tech trials investigating drone spraying of protected cropping structures as well as soil management programs – all working towards increased knowledge within the main key themes of pest management, water use efficiency, waste management and increasing productivity.

In addition to this, we celebrated the opening of the Bundaberg AgTech Hub that will focus on ag tech products and connect producers with cutting edge agricultural technologies such as robotics, artificial intelligence, traceability programs and more.

One business focusing on this space is OzTech Drones based in Bundaberg, which is working with local vegetable producers to find innovative uses for drone applications in horticulture. These include spraying lay flat hose lines with herbicides; increasing visibility of the lines; and reducing crop loss from machinery traffic.

Celebrating industry achievements

The future for the region is exciting. It is home to more than 1,900 agricultural properties with a vegetable industry valued at more than $212 million.

From small and medium sized entities to large corporate agribusinesses, the Wide Bay-Burnett area is a powerhouse of agricultural output and provides around 25 percent of Queensland's fresh produce.

The local industry regularly celebrates our producers and acknowledges their achievements, and we were excited to see local farming family, Attard Family Farms, nominated as a finalist for the Exporter of the Year Award at the recent Queensland Horticulture Export Award (you can read more about the Attard family on the next page).

Continuing the theme of award nominations, I was honoured to be named as a finalist in the Boomaroo Nurseries Women in Horticulture award at the recent Hort Connections conference.

My name was proudly alongside several amazing women that contribute to the industry, including Sue Jenkins – a citrus grower from Mundubbera (which is also located within the Wide Bay-Burnett region).

Here at Bundaberg Fruit and Vegetable Growers, we're committed to supporting the region's growers: celebrating the wins, learning from the challenges, and generating an environment in which regional agribusinesses can thrive.

Drone spraying a lay flat irrigation hose in a sweetpotato crop.

Annie Attard: A trailblazer in the Wide Bay-Burnett region

The Attard family (L-R): Jason, Sam, Hayden, Annie and Francis Attard.

Annie Attard is the vice-president for Women in Sugar as well as a Director at both Bundaberg Sugar Services and Bundaberg Fruit and Vegetable Growers. Her business, Attard Family Farms, was a finalist in the recent Queensland Horticulture Export Awards and it has become one of the first Reef Certified farms in the Wide Bay-Burnett region. VegNET – Wide Bay-Burnett Regional Development Officer Bree Grima sat down with Annie for a brief chat about the business.

Can you provide a brief overview of your business and the produce that you grow?

Attard Family Farms is a fourth-generation farming agribusiness that has been based in the Bundaberg region for over 60 years. Originally from Malta, we predominantly grow sugarcane, rockmelon, macadamias, cherry tomatoes and have previously grown zucchini and baby capsicums. Our operation is on approximately 320 hectares.

The business sells into central markets in Brisbane, Sydney, Melbourne, Newcastle and Adelaide and we export to New Zealand, Japan, and Singapore.

What challenges do you face as a vegetable grower?

Mostly water challenges: the cost and availability of water. Ongoing drought conditions have made it very difficult, and the increased cost of inputs has made it more challenging.

Availability of labour is also an issue – we've always prided ourselves in employing local workers, with supplementation from working holiday makers. Combined with increased regulation and lack of Government support, there are many challenges that we face.

How do you manage these challenges, or try to overcome them?

Being a family-run business, the workload is shared. The business is also looking to diversify.

What new innovations, research and/or practices has your business implemented recently?

The business is accredited to Freshcare; the Harmonised Australian Retailer Produce Scheme (HARPS); Hort360; and the Smartcane Best Management Practice program (Smartcane BMP).

Through the Reef Trust – Great Barrier Reef Foundation Partnership, we have installed water sensors and monitors that survey our water use. This reduces over-watering.

How do you maintain your disease resistance and ongoing sustainability of the farm?

The business has a dedicated spray program overseen by our agronomist, and we implement rotational farming between the sugarcane and ground crops.

Do you have future plans for the farm – is there a particular direction you'd like to pursue? Where would you like to see the business develop across the next decade?

The business is slowly diversifying to macadamias, which require less labour and guarantees viability and sustainability for future generations.

Find out more R&D

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

VegNET – Wide Bay-Burnett 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: VG19009

Hort Innovation Strategic levy investment | VEGETABLE FUND

Veg grower Kim Ngov in-focus

Kim Ngov grows vegetables in Wedderburn, located in Sydney's south-east. VegNET – New South Wales Regional Development Officer Sylvia Jelinek chats to Kim about his business and its innovations as well as R&D practices that he is focused on, which includes using cover crops to build soil health, control weeds and eliminate single-use plastic mulch. Kim has been involved with the *Soil Wealth ICP Phase 2* (VG16078) project, which is a strategic levy investment under the Hort Innovation Vegetable Fund.

Kim Ngov with his daughter, Summer.

Can you please give readers a brief overview of your business and the produce that you grow?

We grow basil in the greenhouse all year round. Outdoors, we grow snow peas and broad beans during the winter and long fruited chilli, snake beans and cherry tomatoes in the summer months.

What new innovations, research and/or practices has your business implemented recently?

In the greenhouse, we have implemented a heating system that keeps the temperature up for growing basil. It is a watering system based on time and temperature, rather than just on time scheduled. If the weather is hotter, the crop will get watered more frequently. On cooler days, the crop receives less frequent watering but has longer watering periods.

Outdoors, I've been moving towards no plastic mulch and focusing on cover crop residue as mulch. Basically, it is no till cover cropping or minimum till. We are currently trialling our first cover crop. We are experimenting with rye corn, millet, sorghum and Sudan grass. On some parts of the farm, we sowed the whole area; while we sowed inter-row those areas where crops were still growing.

Previously we used plastic mulch and raised beds and would cultivate annually. This leads to the soil developing a hard pan that reduced water infiltration, shallow roots and overuse of fertiliser. Cover crops help to break up the hard pan. We've also moved away from using raised beds and developed permanent tractor rows. Growing cover crops is like growing a cash crop that makes no money, so you want inputs – such as such as fertilisers and labour – to be minimal.

In terms of research and development, what do you think is vital to the vegetable industry right now?

We need to maximise crop yields by getting the most of what you put in, rather than growing a lot of plants that give a little return.

Agricultural waste is a huge issue. It is unsustainable to keep growing with plastic. There is so much waste every year and contributes to excess use of artificial fertilisers.

Soil improvement has become a high priority, and this includes improving soil structure and water infiltration. Continual use of plastic mulch creates a hard pan, so it must be constantly tilled between crops. Growing a crop with a large tap root like radishes helps to till the soil for you. Cover cropping will decrease the use of plastic mulch and lessen waste. It also improves weed management and soil structure.

What do you enjoy most about being involved in the vegetable industry?

I like being outdoors and setting up a farm that uses sustainable cropping techniques. I am determined to solve issues and challenges of growing something sustainably that will make money. Experimenting with different management techniques is the main aim of the farm right now. I have diversified away from cucumbers and tomatoes in the greenhouse and growing basil now. I grow basil in peat moss, which uses less fertiliser and grows faster. The restaurants love it.

What is your proudest achievement as a vegetable grower?

My greenhouse basil. By switching growing techniques, we use less effort by thinking 'outside the box' from our normal routine. We are making more money with less effort.

Do you have future plans for the farm – is there a particular direction you'd like to pursue? Where would you like to see the business develop across the next decade?

I want to see where using cover crops take us. If it improves the soil health, disease and weed management – and plants are healthier – it's more sustainable. I want to put back into the soil what I took out by replenishing the soil with compost. This is a five-to-10-year project. Most growers are here for the long run, and I want to see where I can take cover cropping to fix the soil management issues that we've had before.

Find out more R&D

For information about VegNET – New South Wales activities, please contact VegNET – NSW Regional 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

Establishing networks between SA vegetable growers and wider industry

SA drumMUSTER Regional Consultant Rob Kakoschke speaks to Hort SA Conference attendees. Photography by Andrew Beveridge.

AUSVEG SA is the state-wide representative body for South Australia's $2 billion vegetable industry. It works with governments at all levels to advocate on key issues and deliver several key industry development programs that include facilitating VegNET – South Australia, 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.

Hort SA Conference

The inaugural Hort SA Conference attracted around 300 attendees and over 40 exhibitors at the South Australian Produce Markets on Tuesday 18 May.

The one-day event was kindly supported by key event partner, Primary Industries and Regions South Australia, and provided an opportunity for South Australian growers to develop industry connections and hear from leading speakers and exhibitors.

The Hort SA Conference contained various sessions across several different key topics, which included:

- Enza Zaden Director of Business Development Australia and New Zealand, **Ton Van Der Velden**, who focused on international ag-tech developments and commercial developments in international markets.
- Nielsen Research Senior Manager **Lewis Muscat** talked about the latest market data on vegetable consumption across Australia.
- Rabobank International Senior Analyst **Michael Harvey** presented on trends in agricultural lending, currency markets and other financial markets in the coming year.
- Viscon Australia National Engineering Manager **Jon Ferguson** presented on key trends and innovations in packhouse and production technology overseas.
- **James Northcote**, Principal at William Buck Accountants and Advisors, presented the importance of succession management.

The exhibitors brought valuable products that were showcased, and key speakers provided industry-leading information. This generated positive feedback from attendees.

Business Health Check Assessments

AUSVEG SA and Hort Innovation have joined forces to establish a series of Business Health Checks as part of the VegNET SA Program. For this, VegNET SA has engaged leading not-for-profit rural financial advisors Rural Business Support to deliver a series of business health check assessments across our industry.

As part of this project, Rural Business Support will be providing up to 10 vegetable businesses with a free on-site business assessment. From these assessments, business owners will be able to identify risks to their business as well as business capability/capacity constraints, and potential opportunities for sustainable growth.

This program is aimed at business owners of all sizes looking to take stock and improve their current practices, and utilises key staff from Rural Business Support who are experienced in providing independent business advisory support to farmers across Australia.

Looking to the future

VegNET SA has already engaged with several different emerging leaders in the horticulture industry. It plans to establish a long-term emerging leader program based on an effective communication format, and is currently working to consult with stakeholders to determine the appropriate timing and format for the event.

The event is planned to be held on-farm in September or October, which will allow for sit down presentations in a shed followed by a field walk. This will likely take place over three hours in the afternoon followed by catering and drinks. Planning is well-underway for this event, and VegNET SA will provide further updates as it develops the format.

Find out more R&D

Please contact VegNET – South Australia Regional Development Officer Yanyu Liang on 0432 742 896 or at yanyu.liang@ausveg.com.au, or AUSVEG SA CEO Jordan Brooke-Barnett on 0404 772 308 or at jordan.brooke-barnett@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

Premature colouring on capsicum fruit affected by fall armyworm internal feeding.

Fully grown fall armyworm larvae feeding inside capsicum fruit. Images courtesy of Dr Siva Subramaniam (2021).

North Queensland update: Fall armyworm and leafminers under the microscope

The vegetable season is peaking in north Queensland, and all eyes are on new ways to manage fall armyworm (FAW) and thrips as well as new incursions of serpentine and American serpentine leaf miners. This column features a wrap-up of workshops focusing on these pests, while Dr Siva Subramaniam and Dr Cherie Gambley discuss FAW and tospoviruses affecting cucurbits and capsicums.

Pest and disease workshops

Around 70 growers, agronomists and industry personnel attended two workshops in-person and online to discuss a range of pest and diseases that threaten the vegetable and melon industry. The workshops were held in Ayr and Gumlu on 20 and 21 July, with support from AUSVEG and the Department of Agriculture and Fisheries (DAF).

Topics that were discussed included: New chemical developments in pest control; Fall armyworm; Food safety and traceability in vegetables and melons; Viruses in melons and cucurbits; Thrips and tospoviruses in capsicum; General biosecurity obligation and hitchhiker pests; Varroa and bee diseases; and serpentine and vegetable leafminers.

Regional update: Fall armyworm

Fall armyworm has spread rapidly across Australia since its initial detection in the Torres Strait in January 2020. In 2020, sweet corn was severely affected with 30-90 per cent of crops lost in the Bowen and Burdekin region. The sweet corn industry has implemented a range of management strategies including pheromone trapping; comprehensive crop monitoring; early control actions; better spray applications; Integrated Pest Management; and new insecticides, combined with attractants, to lure and kill female moths.

In 2021, the extensive capsicum industry at Gumlu has seen a 30 per cent increase in FAW infestation compared to 2020. In capsicums, young larvae enter the fruit near the stalk and continue to feed inside the fruit. Fully grown larvae either pupate inside the fruit or come out through an exit hole. The infested fruit often appears to have little to no external damage while it yellows and softens as the fruit starts to rot internally.

Key findings from the FAW project funded by the Department of Agriculture and Fisheries, Queensland (DAF, QLD) and Hort Innovation include:

1. FAW moths are active throughout the production season and numbers peak in September and October in the Bowen and Burdekin region.
2. Intensive crop monitoring from seed emergence/seedling stage and early management during early vegetative stage is essential.
3. Lure and kill strategies to target female moths are effective with IPM strategies that support beneficial predator and parasitoid populations.
4. Biological control with Nucleopolyhedrosis virus (NPV) products should be used early at the first and second instar stages (One to seven days after emergence).
5. Insecticides belong to the Carbamate (1A) and Phyrethoid (3A) chemical groups are less effective on FAW compared to other lepidopteran pests.
6. At least 6 endemic species of predators and parasitoids that attack FAW stages were identified, including *Cotesia* sp. and shield and assassin bugs.

Identifying potential parasitoids of the fall armyworm, Spodoptera frugiperda, and the risk to Australian horticulture (MT19015) is a multi-industry strategic levy investment under the Hort Innovation Melon, Nursery, Sweetpotato, Turf and Vegatable Funds.

Thrips movement triggers

Area wide management of vegetable diseases: viruses and bacteria (VG16086) – led by DAF, QLD Principal Plant Pathologist Cherie Gambley – has confirmed the presence of tomato spotted wilt virus (TSWV) and capsicum chlorosis virus (CaCV), impacting capsicum crops in the Bowen and Gumlu regions.

Virus incidence was higher in capsicum crops planted in autumn compared to winter plantings (Dry Season), indicating that weed species were significant hosts of both western flower thrips (*Frankliniella occidentalis*) and tomato thrips (*F. schultzei*). From 2018 to 2020, higher numbers of thrips were found in flowers of bullhead, Indian mallow and butterfly pea; however, at this stage it is unclear if these weeds also host TSWV and CaCV.

Over the next six months, the project is developing a management strategy and outbreak forecast. These will be based on the vector and virus data, weed species and weather conditions collected during the project.

Find out more R&D

For more information about the DAF, QLD projects, please contact Dr Siva Subramaniam at siva.subramaniam@daf.qld.gov.au or Dr Cherie Gambley at cherie.gambley@daf.qld.gov.au.

For information about VegNET – North Queensland activities, please contact Sarah Limpus on 07 4797 9725 or 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.

Project Number: VG19008

Hort Innovation Strategic levy investment | VEGETABLE FUND

Q&A with Jessica Volker

In 2017, horticultural agronomist Jessica Volker and husband Luke, a boiler maker, were looking to purchase an investment home when they came across a house and mango farm package and joked "what if we bought a mango farm instead?" Fast forward to today, and Jessica and Luke – with their two children – run Lower Don Organics, the only organic mango, eggplant and cherry tomato farm in Bowen, north Queensland.

Jessica and Luke Volker with their children Olivia and Liam.

Jessica, you are a grower and agronomist. Can you please give me an overview of your business and the produce that you grow?

In my agronomy business, Korvel Pty Ltd, I support local growers to make agronomic decisions including (but not limited to) chemical applications for control of pests and disease; the use of beneficial insects; nutrition requirements and assistance with auditing requirements.

I also have a certified organic farm with my husband, Luke. We produce mangoes, passionfruit, eggplant and cherry tomatoes. I provide all the agronomic requirements, while Luke takes care of the actual growing. We plant, pick and pack together.

How did you become involved in the vegetable industry, and how did you get to where you are today?

I have no farming background – I went to university to study dentistry. During my first year, I was given the option to choose science subjects and they were all plant-based subjects. I ended up studying applied science majoring in agronomy and undertook my mandatory work experience at Prospect Agriculture with Chris Monsour. Chris guided me to become the agronomist I am today.

When we bought the mango farm, initially we contracted the picking and packing out to another farm and then we invested that in expanding our business into vegetables. We chose to do organic horticulture because it is a niche but in-demand market, and organic is good for my family.

What challenges do you face as a grower, agronomist and woman in horticulture? And how do you manage these?

The major challenge I face is the seasonality of my workload and balancing that while caring for my young family. The Bowen horticulture season has a distinct peak during winter; you get very stretched, physically and mentally. My agronomy experience helps, but having Luke on the farm full-time makes a big difference. I think the biggest challenge for women in horticulture is flexibility. I often find myself on the phone with clients while juggling daycare drop-offs or caring for sick children. As a business and farm owner, I can be flexible with my time but as an employer this can be difficult to manage.

What new innovations, research and/or practices has your business implemented recently?

In my agronomy role, I have helped NQ Aerovation to release beneficial insects. In 2020, I led a project to improve the efficacy of parasitic wasp (*Eretmocerus hayati*) releases to control silverleaf whitefly in vegetable crops using unmanned aerial vehicles (UAV). This new service to the Bowen region does the ordering, delivery and aerial distribution of beneficial insects, and allows my clients to get the most out of our Integrated Pest Management strategy.

In terms of research and development, what do you think is vital to the vegetable industry right now?

I believe skilled staff is our biggest need, along with more extension on research and development that the industry funds. Also levy-funded R&D investigating organic vegetable production, which is often left out.

There are many growers in our region that would benefit greatly from regular one-on-one advice. I know growers can access information online but in my experience, they prefer dealing with people.

Do you have future plans for the farm – is there a particular direction you'd like to pursue? Where would you like to see the business develop across the next decade?

As an agronomist, I am happy with how this business is travelling; I love the group clients I deal with and want to work with them well into the future.

As a grower, I would love to see this business really expand over the next decade. We have already begun on this path this year with Luke now working on the farm full time and the leasing of more ground. We plan to grow more small crops next year, and working on exporting our certified organic mangoes to Asia.

VegNET – Western Australia Regional Development Officer Truyen Vo, Wildeye Technical Consultant Ben Taylor and Tan Pham, a Vietnamese Field Manager based in Wanneroo. Images courtesy of Truyen Vo.
Chuyên viên thực hiện dự án cùng kỹ thuật viên cộng tác và nông dân đứng bên cạnh một hệ thống quan trắc ẩm độ đất.

Water and fertiliser use efficiency improvement

The VegNET Western Australian Strategy is a roadmap for enhancing the state's vegetable growing businesses. As part of this strategy, VegNET – WA Regional Development Officers (RDOs) will work closely with growers and stakeholders to create value by translating innovation into adoptable field practices. Truyen Vo reports.

As part of this project, VegNET – Western Australia Regional Development Officers (RDOs) Sam Grubiša and Truyen Vo are looking at enhancing the efficiency of fertiliser by integrating soil moisture monitoring, with knowledge on rootzone concept and soil characteristics to fine-tune the irrigation schedule.

The desired outcomes for this project are:

1. Develop a strong task force to combine diverse resources and knowledge in irrigation technology.
2. Implement a five-stage extension process to enhance growers' decision-making and innovation adoption.

The five stages of this extension process include:

- Knowledge: Introduce innovation to growers and help them understand the benefits.
- Persuasion: Development of a favourable attitude to the innovation being introduced.
- Decision: Gaining a commitment from growers to adopt the innovation.
- Implementation: Growers putting the innovation into use via a trial-and-error process.
- Confirmation: Reinforcement that the adoption yielded positive outcomes.

Developing a strong task force

The careful implementation of a stakeholder engagement plan has marked the first success step for this project and led to the formation of a strong taskforce in January 2021.

Members of the taskforce share common interests and are committed to contributing resources and knowledge in order to create value by translating new innovation into adoptable field practices.

This taskforce includes experts and scientists from the Western Australian Department of Primary Industry and Rural Development (DPIRD), Perth Natural Resources Management (Perth NRM), Irrigation Australia, Wildeye Soil Moisture Monitoring and VegNET WA RDOs.

Since January 2021, the taskforce has been working together to design field trials and demonstrations and setting them up at two grower properties in Wanneroo.

Implementing field extension services

The plan to implement field trials that demonstrated the benefits of using soil monitoring technology – compared to conventional irrigation techniques growers normally use – was scheduled for February.

Unfortunately, this was delayed due to a COVID-19 lockdown and restrictions that prevented organising the grower meetings and field day events.

In April, the team was finally able to establish the first two field demonstrations.

The field demonstration sites include soil moisture monitoring probes installed at various depths to monitor the soil moisture profile over time, as well as introducing the rootzone concept and soil characteristics to growers.

The participating growers were assisted with downloading an app to their smartphones that allow them to read the soil moisture monitoring results, and better understand the data outputs presented in graph form.

The growers were also presented with field observations of the rootzone and the soil texture at demonstration sites.

When the VegNET RDOs spoke with the participants about their conventional irrigation practices, they learned that water was being applied once every day for 1-2 hours through a medium flow drip tap (one litre of water per drip per hour).

Fertiliser was applied through fertigation every 2-3 days when crops were watered.

From the data outputted by the soil moisture monitoring, they learned that, at the depth of 60cm, the soil is as wet as soil at 30cm – when water is applied.

Further findings

Explanation provided by the RDOs helped growers to realise that water was leaking down beyond the rootzone, which meant that water, along with fertiliser, was being wasted.

Furthermore, the fertiliser that was applied to the rootzone (at a 30cm depth) was being washed away by the water application on following days.

The grower has taken on board the RDOs' suggestion that they try a new water and fertiliser application schedule and split the irrigation to water more than once a day, with shorter application times.

The trial aims to evaluate the benefits to the crop performance and to reduce water wastage by using soil moisture monitoring over the cropping season.

The RDOs will continue working with DPIRD collaborators to estimate the value of saved water and fertiliser throughout the duration of the trial.

Find out more R&D

For more information, please contact Regional Development Officer Truyen Vo at truyen.vo@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

* This article has been provided by vegetablesWA, and first appeared in the winter 2021 edition of *WA Grower* magazine.

The rootzone within 30cm depth.
Tầng rễ hấp thu trong phạm vi độ sâu 30cm.

Cập nhật công việc cải thiện hiệu quả sử dụng nước và phân bón trong dự án VegNET WA

Như đã đề cập trong một bài báo trong ấn ản mùa hè 2020 của tạp chí hiệp hôi Rau cải Tây úc – Lộ trình tăng cường năng lực doanh nghiệp rau cải và chiến lược công tác của mạng lưới khuyến nông Tây Úc – các chuyên viên khuyến nông sẽ sát cánh với nông gia và các cơ quan hửu quan tạo ra giá trị bằng cách diễn giải các tiến bộ kỹ thuật ra thành các biệp pháp canh tác ứng dụng được trong sản xuất.

Một trong các tiến bộ kỹ thuật được đưa vào dự án là kỹ thuật tăng cường hiệu quả sử dụng nước và phân bón bằng cách phối hợp quan trắc ẩm độ đất với khái niệm "vùng rễ" và kiến thức về các đặc tính đất đai để tinh chỉnh chế độ tưới. Hai nhiệm vụ khuyến nông chính trong dự án để đạt được mục tiêu trên là:

(i) Xây dựng liên minh đa thanh phần để phối hợp kiến thức, nguồn lực và kỹ thuật từ nhiều phía.

(ii) Thực hiện dự án theo cách mà sẽ giúp nông gia trãi qua tiến trình 5 bước trong ứng dụng tiến bộ kỹ thuật. Tiến trình đó là:
- Kiến thức (Giúp nông gia tiếp cận với thông tin, kiến thức để tăng cường hiểu biết về kỹ thuật mới và lợi ích của nó).
- Thuyết phục (Nông gia tự hình thành thái độ tích cực đối với kỹ thuật mới).
- Quyết định (Nông gia tự cam kết ứng dụng).
- Thực hiện (Đưa kỹ thuật mới vào thực hành).
- Công nhận (Tăng cường ứng dụng sau khi thấy được lợi ích của kỹ thuật mới)

Xây dựng liên minh

Việc thực hiện cẩn thận kế hoạch kêu gọi liên minh đã mang lại kết quả ban đầu cho dự án – đó là sự hình thành liên minh vào 1/2021. Liên minh bao gồm các chuyên gia và nhà nghiên cứu của Bộ Nông nghiệp và Phát triển Nông thôn, Văn phòng quản lý tài nguyên thiên nhiên (Perth Natural resources Management), Hiệp hội tưới tiêu Úc (Irrigation Australia), Công ty chuyên môn về quan trắc ẩm độ đất Wildeye và chuyên viên phát triển nông thôn của dự án mang lưới khuyến nông rau cải tây Úc (VegNET WA). Các thanh viên của liên minh chia sẽ quan tâm chung và cam kết đóng góp nguồn lực, kiến thức để biến kỹ thuật tưới tiêu tiến bộ thành các biện pháp dể ứng dụng trong sản xuất cho nông gia.

Liên minh đã bắt đầu làm việc với nhau hồi 2/2021 để thiết kế các thí nghiệm và các điểm trình bày mô hình ngoài đồng và cùng với các nông gia tham ga dự án thực hiện các thí nghiệm này tại Wanneroo, Tây Úc.

Thực hiện công tác khuyến nông

Kế hoạch ban đầu là thực hiện 2 thí nghiệm vào tháng 2/2021 trên 2 trang trại hoa màu tại Wanneroo để so sánh lợi ích của kỹ thuật mới (tưới nước dựa vào kết quả quan trắc ẩm độ đất) so với cách tưới mà nông gia đang áp dụng. Không may là các qui định hạn chế tiếp xúc và đi lại do Covid đã ngăn cản các bước họp nông dân và thăm viếng nông gia để thực hiện kế hoạch này.

Tuy nhiên chúng tôi cũng thiết lập được 2 điểm trình bày hệ thống quan trắc ẩm độ đất vào 4/2021.

Tại các điểm trình bày này chúng tôi đã lắp đặt các thiết bị đo ẩm độ đất ở các độ sâu 15cm, 30cm, 45 cm, và 60cm để liên tục theo dõi ẩm độ đất cũng như thị phạm cho nông dân thấy phạm vi vùng rễ hoạt động của cây cà và ớt đang mang trái không sâu hơn 30cm trên đất cát.

Nông dân tham gia cũng được hỗ trợ cài đặt ứng dụng để theo dõi tình trạng ẩm độ của đất trên điện thoại di dộng và hiểu được ý nghĩa của các biểu đồ biến động ẩm độ đất hiện trên điện thoại.

Tìm hiểu qua nông dân tham gia dự án về cách tưới nước đang áp dụng cho thấy rằng hoa màu được tưới bằng hệ thống tưới nhỏ giọt (T-tap, thường là dung loại T-tap có lượng nước ra 1l/lỗ/giờ) mỗi ngày một lần, mỗi lần hơn 60-120 phút. Phân bón cũng được hòa vào nước và tưới theo cách này 2-3 ngày/lần.

Mặt khác, kết quả quan trắc ẩm độ đất cho thấy đất ở độ sâu 60cm cũng có biến động ẩm độ giống như đất ở độ sâu 30cm. Dựa trên ksết quả này chuyên viên khuyến nông đã giải thích cho nông dân tham gia hiểu rằng có sự thấm sâu của nước khỏi giới hạn 30cm của vùng rễ. Sau mỗi lần tưới nước bị thất thoát và phân bón hòa tan trong nước cũng bị thất thoát theo cách này. Hơn nữa, lượng phân bón còn giử lại được trong nước ở lớp đất 30cm cũng tiếp tục bị rửa trôi theo nước tưới của ngày hôm sau.

Cho đến nay những người nông dân tham gia thử nghiệm đã đồng ý thử tưới theo đề nghị của chuyên viên khuyến nông là giảm thời gian tưới 60-120 phút xuống còn 25 phút (nếu chỉ tưới 1 lần/ngày) hoặc là tưới 2 lần/ngày mỗi lần 15 phút nếu có điều kiện thời gian. Kết quả sau 24 giờ cho thấy rất rỏ sự hạn chế thất thoát nước xuống khỏi tầng rễ 30cm.

Nhóm công tác cũng cố gắng tính toán lượng nước phân bón được ngăn chặn khỏi thất thoát để xác định giá trị tiết kiệm được khi áp dụng kỹ thuật tưới này.

Thông tin chi tiết
Võ Thế Truyền
Chuyên viên phát triển nông thôn
T 08 9486 7515 M 0457 457 559
E truyen.vo@vegetableswa.com.au

Acknowledgements

Vegetables Australia would like to thank VegNET – Western Australia Regional Development Officer Truyen Vo for supplying the Vietnamese and English versions of this article.

View from above: 11 international seed companies displayed the best and newest in vegetable and fruit varieties at the Lockyer Valley Growers Expo. Image courtesy of Luke Willey Photography.

The best of Lockyer Valley on-show at expo

Queensland's Lockyer Valley was the place to be on 6-7 June, with the 2021 Lockyer Valley Growers Expo taking place. The event was hosted by the Lockyer Valley Growers Inc. and attracted approximately 1,000 visitors who saw the latest in fruit and vegetable seed trials. VegNET Regional Development Officer – Southern Queensland Zara Hall reports.

Visitors to the Lockyer Valley Growers Expo in June were treated to perfect south-east Queensland winter weather. Blue skies, sunny days and a crisp starry night made for ideal conditions for a celebration of the horticulture industry at the 2021 exhibition and gala dinner.

Across two days, 11 international seed companies displayed the best and newest in vegetable and fruit varieties with displays from Australis Seed Company, BASF/Nunhems Seed, Bayer/Seminis Seed, Bejo, Enza Zaden, Fairbanks Seed, HM Clause, Lefroy Valley, Rijk Zwaan, South Pacific Seed and Terranova Seeds.

Lefroy Valley's team – led by Chris Newmarch and Warren Ford – took out the prize for best vegetable display for a second expo in a row, with a fun and creative display including a scarecrow and eye-catching signage as well as a flawless vegetable and fruit display.

Around 1,000 visitors attended the event, and they were able to network with a diverse range of companies and organisations from across the whole supply chain including Withcott Seedlings, Achmea Farm Insurance, AUSVEG, Biological Services, Boomaroo Nurseries, Candy Soil, Elders, Growcom, I Comply, Kenso, Lockyer Valley Regional Council, Nufarm, Opal Packaging, Syngenta, TriCal and Vanderfield.

Gala dinner under the stars

Growers and industry members who attended the Sunday night gala dinner were treated to a uniquely horticultural dining experience. On sunset, guests were guided from the exhibition entrance through the vegetable variety trials with twinkle lights overhead and a mosaic of red-carpet squares underfoot, to a seated dinner with entertainment and fine dining for the 450 guests. Magicians, musicians and comedians entertained the guests while they enjoyed a three-course meal showcasing local vegetable produce overlooking the expo variety trials.

Border restrictions due to COVID-19 meant that Victorian growers and industry members, as well as overseas visitors (New Zealand excepted), were unable to attend this year's expo. Our thoughts are with our southern counterparts who were unable to attend the expo or Hort Connections. We look forward to catching up with you when travel restrictions change. Dates for the next expo remain undecided but likely will occur three years from now if water security can be assured. See you all in three years!

Acknowledgements

The Lockyer Valley Growers Inc. Committee would like to thank all growers and industry members who attended the exhibition and gala dinner.

We would like to express our gratitude to our team of volunteers who assisted in the lead-up, clean-up and on the days.

Thank you to farm staff at the Department of Agriculture and Fisheries, Queensland for growing the trials. We gratefully acknowledge the contributions of Sharron Windolf from Windolf Farms and Tammy Litzow from Black Crow Organics for their vision and energy in producing a spectacular event in celebration of our great industry.

To our sponsors of the expo, thank you for your ongoing support of the Lockyer Valley Growers Inc. – it is because of your generosity that this event was able to take place.

We gratefully acknowledge expo sponsors: Withcott Seedlings, Ag Requirements, Elders, Boomaroo, Nurien Ag Solutions, Nolan's Transport, I Comply, Perfection, Pacific Fertiliser, Enza Zaden, Boomaroo, Vanderfield, TriCal, Tafe, Opal Packaging, Lockyer Valley Regional Council, Achmea Farm Insurance, E.E. Muir & Sons, and Leppington Speedy Seedlings.

Images from the Lockyer Valley Growers Expo and gala dinner can be found on the next page.

Find out more R&D

Please contact VegNET – Southern Queensland Regional Development Officer Zara Hall on 0456 956 340 or email ido@lockyervalleygrowers.com.au.

VegNET – Southern 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.

Project Number: VG19010

Hort Innovation Strategic levy investment | VEGETABLE FUND

Around a thousand visitors who attended the Lockyer Valley Growers Expo were able to network with a diverse range of companies and organisations from across the whole supply chain.
Images courtesy of Luke Willey, Voice Photography.

There were many fruit and vegetable varieties on display across the two-day event.

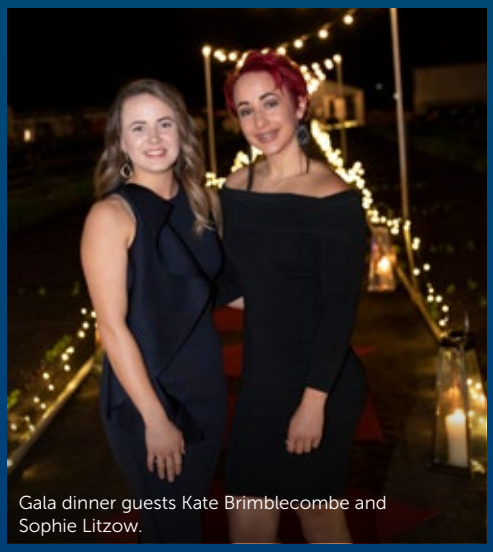
The Lockyer Valley Growers Expo was a resounding success for the region.

On sunset, 450 guests were guided from the exhibition entrance through the vegetable variety trials to a seated dinner with entertainment and fine dining.

Guests arrive to the Lockyer Valley Grower Expo gala dinner.

Event organisers (from left to right) Sharron Windolf, Michael Sippel and Tammy Litzow.
The trio was instrumental to the expo's success.

The gala dinner was held on Sunday 6 June.



Gala dinner guests Kate Brimblecombe and Sophie Litzow.

Cross-industry engagement key to success in Tasmanian horticulture

In this column, VegNET – Tasmania Regional Development Officer Ossie Lang provides an update on industry activities across the Apple Isle. These include workshops – co-hosted with several other horticultural industries – and the Walker Ag Forum, which is coordinated by Tasmanian agronomist Tim Walker.

Tackling herbicide resistance: Understanding the risks

One of the focus areas for VegNET – Tasmania is weed management and minimising the risks of herbicide resistance.

Fortunately, growers in Tasmania have a uniquely wide range of crop options, including vegetables, potatoes, onions, pyrethrum, poppies, hemp, cereals, along with pasture seed and vegetable seed crops. While this has helped the industry delay herbicide resistance, it was identified– when considering how to manage the risks – that a cross-industry approach would be required to achieve success with this issue.

After some earlier industry engagement, VegNET hosted a cross-industry workshop in late July. The day was successful in bringing together agronomists, field officers and growers from a range of Tasmanian cropping industries.

While these groups often work in silos, the collaborative discussion identified several priority areas that need further investigation and follow-up opportunities for VegNET, which will focus on upskilling growers and contractors.

We were also fortunate to have two excellent speakers join us virtually on the day. Firstly, Liam Hescock from Growave explained the work that his company is undertaking to develop a microwave weed control technology.

Dr Peter Boutsalis from Plant Science Consulting then discussed the mechanisms of resistance, what to look for in identifying resistance, how to get testing completed, and tips on how to maximise efficacy of herbicides.

One of the key items from Peter's discussion was that pollen spread from ryegrass and wild radish can quickly transfer resistant genetics across a property and area. This helped a number of participants in the room understand how they could see resistance issues arise in areas where it shouldn't be and how well-managed paddocks can still see herbicide resistant weeds creep in from surrounding areas.

Learning from experts and leaders

VegNET was also fortunate to be able to support this year's Walker Ag Industry Forum. The forum brought together around 80 growers, agronomists, field officers and suppliers to hear about a range of topics that impact the Tasmanian vegetable and cropping industry.

Event organiser and agronomist, Tim Walker, explained why he hosts these events.

"The forum fills a gap and gives an opportunity for the cropping industry in north-western Tasmania to come together and learn about the latest in best practice," Tim said.

This year's program boasted a wide range of speakers covering topics including biosecurity, education, training, crop nutrition, pesticides, new seed varieties, soil health, erosion control and truffle farming.

Speakers were supported by a expansive trade show, which included the latest in potato seeding equipment and lightweight machinery for crop management.

This was second Walker Ag Forum, and it was a tremendous success. The huge range of topics covered meant that everyone left with something to reconsider for the upcoming season, even something as simple as a better understanding of the benefits of liquid fertilisers, or a new option to consider for employing their next staff member.

For further details about upcoming events, be sure to follow VegNET – Tasmania on Facebook or Twitter, or get in touch with myself via the details below to subscribe to our e-newsletter mailing list.

Walker Ag Industry Forum host Tim Walker pictured welcoming attendees.

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

Investigating links between pathogen survival and contaminated irrigation water

Water is a potential source of microbial contamination for vegetable crops – whether applied through irrigation, crop protection sprays, or postharvest washes. Ongoing work is investigating how damage affects die off rates of pathogens applied through irrigation water. Project team member Dr Jenny Ekman from Applied Horticultural Research reports.

Many significant food safety outbreaks associated with salad greens can be traced back to contaminated water. Water that contains human pathogens such as *E. coli, Salmonella* spp. or *Listeria monocytogenes* can contaminate vegetables if it contacts the edible part.

Pathogen persistence from paddock to plate (VG16042) – a strategic levy investment under the Hort Innovation Vegetable Fund – found that *E. coli* and *Salmonella* on leafy vegetables fell below, or close to, detectable levels within 48 hours of irrigation. In contrast, bacteria could survive, and even multiply, if plants were physically damaged.

However, it was unknown whether natural damage from insect feeding or disease also increased persistence of human pathogens.

Further studies

Investigations to answer these remaining questions are underway with funding from the Australian Centre for International Agricultural Research (ACIAR).

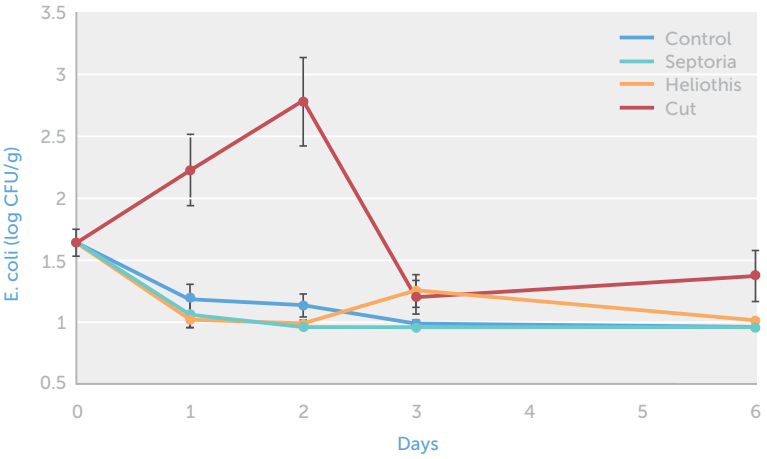
An initial trial in Cobbitty, New South Wales during spring 2020 evaluated die off rates of *E. coli* on lettuce. Lettuces were damaged through insect feeding (*Heliothis*), disease (*Septoria* leaf spot), or physical injury (leaf tips cut with scissors), then irrigated with water containing log 3.2 CFU/ml *E. coli.* Leaf samples were taken for microbial testing after 0, 1, 2, 3 and 6 days.

Cutting leaves increased persistence

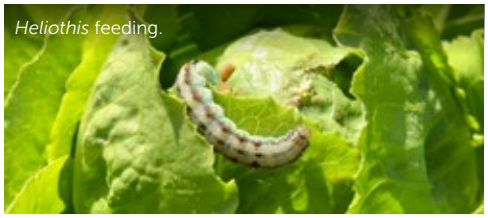
Average populations of *E. coli* multiplied ten-fold on physically damaged leaves within two days of damage and irrigation with contaminated water. In contrast, disease did not increase persistence relative to the undamaged controls, and *Heliothis* caterpillars had only a minor effect. These results suggest that although avoiding physical damage is critical, insect feeding and disease do not affect the potential for contamination by irrigation water.

Perhaps, surprisingly, no previous studies have examined how food safety is affected by damage that can realistically occur during production. The trial will be repeated over spring and summer 2021 to confirm initial results.

Populations of *E. coli* on damaged and intact (control) cos lettuce following irrigation with contaminated water. Mean values were calculated from twelve replicates.



Source: Applied Horticultural Research.


Heliothis feeding.


Physical injury.


Septoria leaf spot.

Damage applied to Cos lettuce plants. Control plants were left undamaged. Note that the amounts of damage were still small enough that the lettuces could potentially go through to the consumer. Images courtesy of Applied Horticultural Research.

Recommendations to reduce risk

If vegetables have been damaged, avoiding contact with poor quality water (>100 CFU/ml E. coli) for at least 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 always avoid contact between cos lettuces and contaminated water.

Further information

ACIAR project (HORT 2016-188) is developing good agricultural practices for Filipino vegetable growers. In the Philippines, irrigation water is frequently contaminated, so the project is helping farmers reduce food safety risks. For more information, please contact Jenny Ekman or go to: aciar.gov.au/project/hort-2016-188.

Guidelines on reducing risk from manure and safe use of irrigation water, as well as fact sheets produced by project VG16042, 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.

Applied Horticultural Research was supported by the Australian Centre for International Agricultural Research.

Don't pay the price with your life: Focus on electrical safety

The Fair Farms Program was designed and developed by Growcom to ensure Australia has a strong, thriving horticultural industry that benefits not only individual farmers and the industry, but the broader community. In this column, the team focuses on powerlines and what horticultural workers can do to minimise the risk of an electrical incident occurring that may result in injury or even death.

In July, a worker on a pineapple farm in Queensland tragically lost their life after a harvester hit overhead powerlines. Each year too many farm workers are killed or seriously injured by electrical incidents on rural properties.

Within the Fair Farms Program, we remind employers of their workplace health and safety standards that help make sure tragedies like this don't happen. We are here to raise awareness and support farms to help prevent the chances of accidents, so that the entire Australian horticulture industry thrives.

Tips to consider when working around powerlines

Plant and machinery, irrigation pipes, augers, cranes and excavators all have the potential to contact powerlines and when that happens the result can be deadly. Electricity from powerlines can arc or jump across lines, **even if there is no direct contact**.

Powerlines can sag between the poles and can be as much as three or four metres below the cross arms supporting them. Sometimes they are difficult to see – on the horizon, in low light or in high winds that force the powerlines to sway some distance.

Workers and equipment must be kept a safe distance from powerlines. Electrical safety laws in each state and territory set out the minimum safe distances (exclusion zones).

There are practical steps farmers can take to keep workers safe:

- Arrange for your electricity provider to install visual markers. Install highly visible ground markers and have a safety observer on the ground.
- Work in the direction *away* from powerlines, not towards them.
- Avoid working near powerlines if you can. If you can't, then know the height and prevent entering the exclusion zone. Re-check clearances if you buy new plant and equipment.
- Report unsafe power poles on or near your property to the electricity distributor. If you own the poles, have them periodically checked by a licenced electrical contractor.
- Don't locate machinery or equipment under powerlines and always lower machinery near powerlines.
- Store irrigation pipes well away from powerlines.
- Train your workers to identify where powerlines are located and induct all workers and visitors.
- Keep vegetation and crops away from power poles and stay wires.
- Ensure your emergency procedures are up to date and your workers are familiar with them.

Powerlines may also be located below ground. Before doing any work involving trenching or drilling holes, it is necessary to take steps to find out if underground electrical cables are at or near where the work is to be done. The 'Dial Before You Dig' service is available around Australia and can be contacted through its website: 1100.com.au.

Whether powerlines are above ground or below ground, electrical safety laws require that before commencing work you complete a risk assessment and put in place suitable safety measures that might include the above.

Applying a risk management approach to electrical safety involves:

- Identifying the risk.
- Assessing the risk.
- Decide on what is needed to control the risk.
- Implement the control measures.
- Monitor and review the controls to assess effectiveness.

Taking a little time to ensure the work is done safely could save a lot of heartache and trouble. It could save a life – and that life could be yours.

Fair Farms supports all members of the Australian horticulture supply chain with the tools, information and training they need to be a great employer. In addition, participants of the program can demonstrate their compliance to their customers, workers and consumers through certification. Weeding out the bad seeds who undercut the industry to raise their own profits is a priority, so is making sure businesses can attract and retain staff.

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 Federal Department of Agriculture, Water and the Environment and AUSVEG.

FAIR FARMS
FOSTERING FAIR EMPLOYMENT PRACTICES IN THE AUSTRALIAN HORTICULTURE INDUSTRY

Choosing the right inspection equipment for fresh produce

The COVID-19 pandemic has changed the way people shop for fresh produce. Fruit and vegetables have seen a significant shift to being pre-packaged, and in response growers and fresh produce companies are pursuing strategic partnerships to innovate their packaging and inspection processes and ensure quality and safety. *Vegetables Australia* takes a look at some of the innovative inspection technologies that are available today.

Having a metal detector, checkweigher and sometimes even an x-ray machine at the end of the production line allows growers and fresh produce companies to easily comply with global safety standards and meet the demands of quality and safety conscious retailers and consumers.

As an Australian-based, global manufacturer of food processing equipment, Heat and Control understand the importance of choosing the right inspection equipment for fresh produce, retail, food service and ready-meal operations.

Metal detection

This part of the inspection process can occur at several points in the line and its primary purpose is to detect for metal contamination. Choosing the right metal detector is important and should be based on the type of produce you intend to run.

While metal detection in food processing is primarily about quality control and consumer protection, it also protects other machinery in the production line because even the smallest metal particle can lead to machinery malfunction, resulting in revenue decrease as a result of production downtime.

Weight control

The primary function of a checkweigher is to monitor end weight of a packaged product. It is key for delivering what consumers expect by providing accurate verification of the weight of the package, and counting and detecting missing components. Technology used in association with checkweighing allows for the collection and retention of important production run data and creates a database of information.

Digital sorting

Digital sorting systems consistently identify and remove objects based on colour, structure, shape, and size at a significantly faster rate than manual inspection. They find contaminants such as sticks, stems, stones and even mice and are also used to sort by size and shape and grade by discolouration.

A wide range of systems are available for specific applications, including colour sorters and smart laser sorters.

Seal checking

Choosing the right leak detection equipment is an important part of the inspection process and different methods are available.

For larger scale operations, an in-line pressure testing unit classified as a 'gross leak detector' can be used and works by testing for air in the package. This type of technology requires air in the package, but there is equipment available that detects leaks by creating a vacuum and then testing for air escaping from the package that way.

Heat and Control can innovate your fresh produce inspection process. Readers can get in touch using the contact information provided.

The primary function of a checkweigher is to monitor end weight of a packaged product.

About Heat and Control

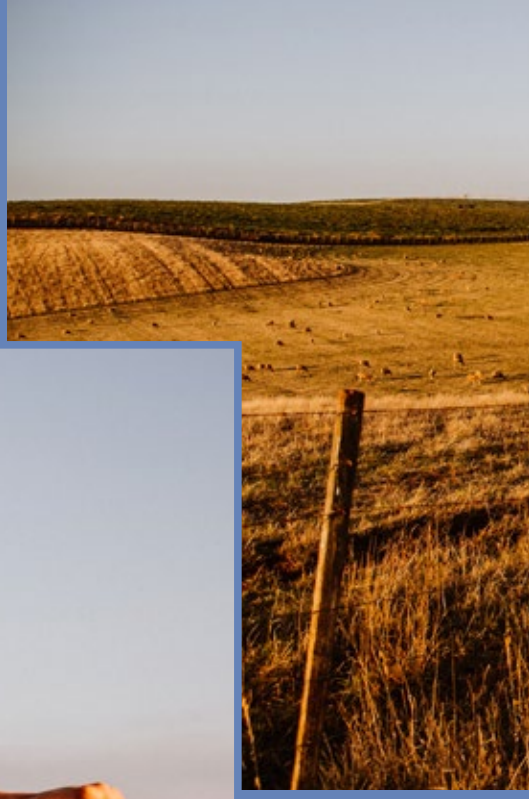
Established in 1950, Heat and Control is a privately-owned company with a global team that has built an extensive knowledge bank and developed a wealth of experience and expertise. The company provides access to production and technical support from a network of engineers, food technicians, field service technicians and skilled tradespeople. Support teams provide food manufacturers with confidence to achieve production goals.

It has 10 manufacturing facilities, 11 test centres and more than 30 offices globally. Services include testing, design, engineering, manufacturing, installation commissioning, user training, spare parts, and provision of after sales service.

Find out more

Please email info@heatandcontrol.com or visit heatandcontrol.com.

Ambition breeding success for Caitlin Radford



Photography by Flick & Dave.

Name: **Caitlin Radford**

Age: **22**

Works: **CO Agriculture Pty Ltd**

Location: **Moriarty, Tasmania**

Farms: **Mixed cropping, sheep and cattle**

How did you first become involved in the vegetable industry?

I was born into a farming family, so naturally became involved by default! Following on from that, I have started my own company along with my partner Owen, CO Agriculture Pty Ltd. Since then, we share farmed with my grandparents for 12 months before taking over the property lease for this financial year.

You are a fifth-generation farmer. Why did you decide to follow in your family's footsteps and remain in the Radford business?

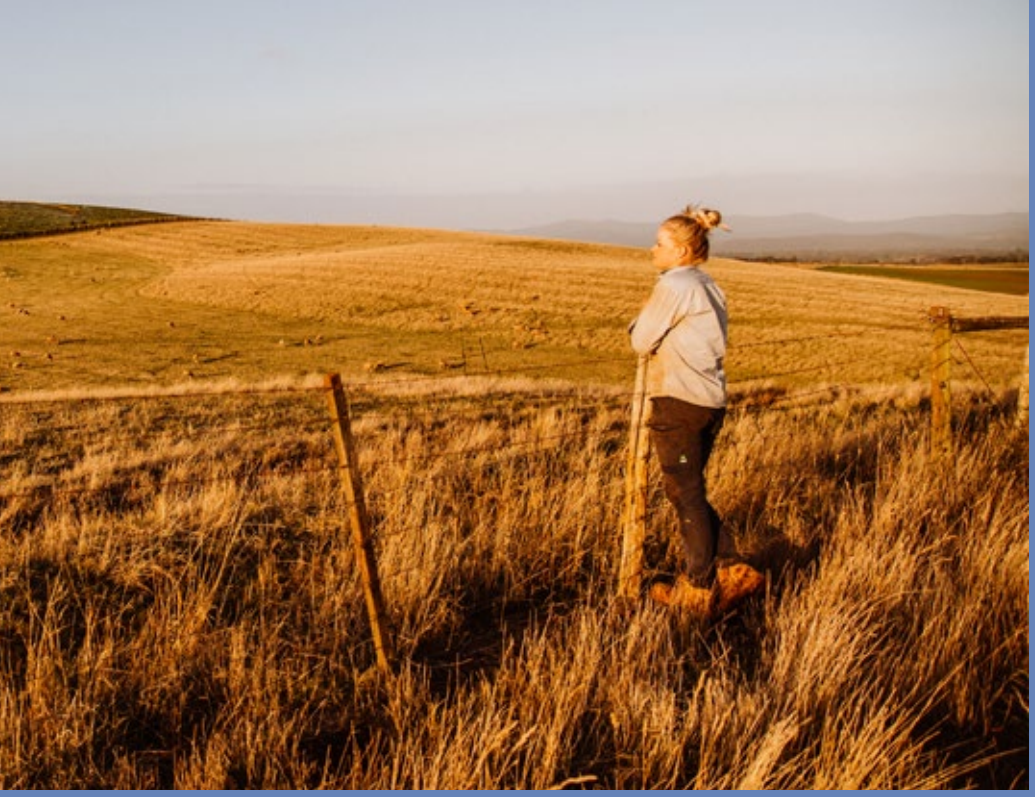
The north-west coast of Tasmania is truly the most beautiful place on earth. We are so lucky to be able to farm so close to town, it is very well located. I absolutely loved my childhood and that is what I would love my children to have one day. I am following in my family's footsteps as it is also my passion, and I would like the opportunity to grow the business and then pass that onto the next generation. Any family farm is special in today's age, and even more so when it is Australian-owned.

What is your role in the business? And what are your responsibilities connected to your role?

After not knowing what to do after Year 12, I had a gap year and worked on the family farm. I then completed my Certificate III in Agriculture as a part-time apprentice on the family farm with Mum and Dad. I share farmed with my grandparents, Reuben and Gladys – five minutes up the road – for 12 months. I have gone on to rent the farm with Owen under CO Agriculture Pty Ltd. Now I am responsible for the whole business, which has been a huge learning curve!

What do you both enjoy most about working in the vegetable industry, and how do you maintain your enthusiasm?

I don't realise how much I love farming and growing vegetables until I get the opportunity to talk about it. It is the most special thing to be able to share that passion with others and work with your family (even though it can be challenging at times!) I love the fact that I am helping feed our nation and other countries around the world.



Where do you receive your on-farm practice advice and information from?

Mostly from my dad, Shane – I am sure he gets sick of all my phone calls! I am so lucky to have such a great team of people around me: Reuben, my agronomists, field officers, contractors and the like. They all play such an important role to ensure that the farm runs smoothly, and we produce the best crops that we can. I am on a steep learning curve and while not perfect, we have been lucky with a good season thus far.

What new innovations, research and/or practices has your business implemented recently? What are you doing differently to other grower operations?

I wouldn't say we are doing anything ground-breaking but we are very mindful of our environment and keeping the farm healthy for years to come. Recently Shane started strip-tilling for his beans, which seems to be a success this year. It is a goal of mine to gradually introduce more technology as I can to keep the farm efficient and see what works best for our operations. Through my Diploma, I am also changing some business practices to make it more efficient.

You received the Australian Apprentice of the Year at the National Training Awards in November last year. What did winning this award mean to you?

This award was so huge for me in many ways. It means another step forward for agriculture and the importance of training for young men and women within our industry. It was also announced on National Agriculture Day, so it was even more special!

Has winning the award opened any doors for you? If so, how?

Most definitely. A lot of networking, which I find so important. It has allowed me to talk to high school students, TasTafe students as well as mature aged groups about agriculture, my story and the importance of training.

I will continue to do this for as long as I can to keep agriculture at the forefront and to hopefully get more agriculture training into schools, so the next generations can grow up knowing exactly where their food is coming from and how it got to them.

I was lucky enough to be nominated for the Corteva Young Grower of the Year at Hort Connections, and we travelled to Brisbane in June. *Landline* also did a small feature on my story earlier in the year as well as local newspapers and radio stations. It has been a whirlwind, but I am so grateful to be able to be an ambassador for our industry as well as for VET training.

What other studies have you undertaken since entering the agriculture industry?

I am now completing a Diploma of Agribusiness Management through TasTafe. I found the Certificate III in Agriculture to be mostly the practical farm-hand side of things, while the Diploma is much more about business and management of the farm, which is perfect for where I am at now. I also completed a Cert IV in Leadership and Management online through Rural Youth Tasmania earlier in the year.

You're a member of Rural Youth Tasmania. What does this involve, and what activities are undertaken through this program?

Rural Youth Tasmania is for young people between the ages of 15-30 years. It aims to provide opportunities for the personal development of members through social, educational, cultural and agricultural activities. We organise the Agfest Field Days, which are held in May each year. In a normal year, we would have over 60,000 people attend the three days and is solely run by us as volunteers and our awesome ladies in the office. We have moved to a four-day event this year and this will continue into 2022. I am now the Vice Chairman of Agfest for 2022!

Where do you see yourself in five years' time?

I would love to be on a farm that I own along with Owen. Hopefully big enough one day to support both of us full-time. I would love to stay in the same area and keep going as a mixed enterprise farm. Possibility of children or getting ready for children too at some stage! Hopefully still riding horses and involved with my community work.

How do you think more young people could be encouraged to study and take up jobs in the vegetable industry?

The biggest thing is making people understand just how large our industry is. There are more jobs than just being a farmer and the supply chain that goes along with it. Working as a lab scientist, in the processing line or as an agronomist are just some examples of how people can get involved.

I think COVID has at least been good for showing people how important our industry is. I see training as an insurance policy in that it can make you more work-ready and can open doors into new careers that you may not have thought possible. Agriculture has a way of making sure you are never bored, and you are forever learning new things.

Irrigation in-focus: What to expect from drip emitters

Drip is now widely accepted as an efficient and cost-effective way to irrigate your crops, but how do you tell the difference between brands and models? In this column, Netafim Product Manager Wayne Ingram discusses non-pressure compensating (NPC) emitters, which are very commonly used in Thin Wall Dripline.

Emitter structure

Water passes through the emitter filter and enters the flow path/labyrinth. The sharp teeth keep fine particles in suspension and enable them to exit the emitter. A hole or flap above the bath is the final exit point for the water.

Clog resistance

The greatest concern for most growers is their drippers clogging. Assuming quality design, filtration, and installation is all in place, then it is largely up to the dripper to perform reliably and stay clean.
Clog resistance is a function of these parameters, all of which are measurable.

- Emitter Filtration Area (mm^2): *Bigger is better, like a suction strainer on a pump.*
- Labyrinth Length (mm): *Shorter is better, less opportunity for small particles to settle.*
- Labyrinth Depth (mm): *Deeper is better, allows larger particles to pass through.*
- Labyrinth Width (mm): *Wider is better, allows larger particles to pass through.*

To evaluate one brand of emitter against another, the below table should be used as a guide. Insist on your irrigation supplier providing the numbers shown.

Accuracy and uniformity

Non-pressure compensating emitters will discharge a higher flow when more pressure is introduced into the lateral.
The equation for Emitter Flow is:
Q = K*P^x, where:
Q = Flow in litres per hour.
K = constant *(see table below)*.
P = pressure expressed in metres head.
x = Flow Exponent *(see table below; lower is better)*.

For the dripper/emitter in the table above: if the pressure is increased by 100 per cent, the flow only increases 37 per cent (using Exponent x = 0.45).

Other emitters with an exponent of 0.50 will have a 50 per cent increase in discharge, with 100 per cent increase in pressure.

What this means is an emitter with a lower flow exponent will have better uniformity if the lateral length is the same compared with an emitter with a higher flow exponent. Likewise, the grower can have a longer lateral – all other things being equal.

Therefore, with a lower flow exponent – all things being equal – the grower can expect higher uniformity of irrigation within the irrigated block. High uniformity is achieved with a low flow variation within the block.

Excellent uniformity would be a block that has 10 per cent (or less) flow variation (FV).

This 10 per cent FV means that the highest output emitter discharges five per cent more than the average flow emitter, and conversely the lowest output emitter discharges five per cent less than the average flow emitter.

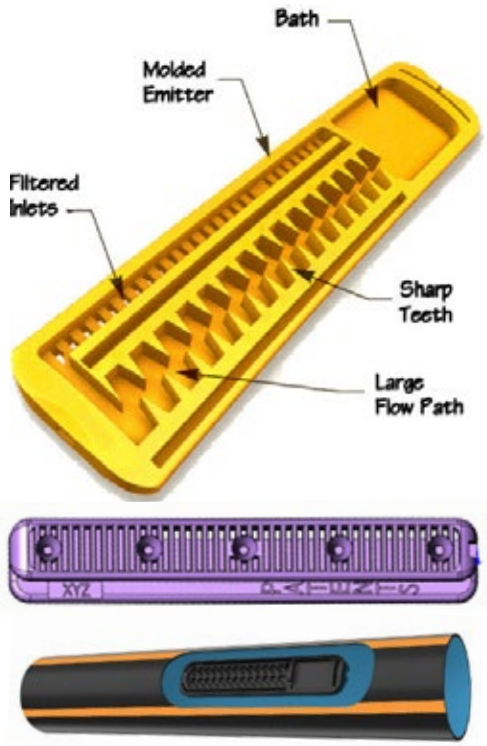
When reading an irrigation plan, this could be written as FV = 10% (-5%, +5%).

It is thought that a one per cent decrease in flow variation equates to a one per cent decrease in yield.

Quality is key

Driplines in the market should at the very least comply with *ISO 9261 – Agricultural Irrigation Equipment Emitters and Emitting Pipe - Specification and Test Methods*.

This provides peace of mind to the grower that the dripline they purchase meets this International Standard.



NPC emitter in dripline - cutaway.

Drippers Technical Data

12080, 16080, 16100, 22080, 22100 - 0.20, 0.25 wall thickness driplines

Flow Rate* (L/H)	Max. working pressure** (BAR)	Water passages dimensions width-depth-length (MM)	Filtration area (MM^2)	Constant K	Exponent X	Recommended Filtration (MICRON)/ (MESH)
0.35	1.0/1.1/ 1.2/1.4	0.35 x 0.34 x 23	12	0.116	0.48	130/120
0.72		0.59 x 0.33 x 25	12	0.238	0.48	130/120
1.05		0.51 x 0.44 x 13	14	0.373	0.45	130/120
1.60		0.65 x 0.55 x 13	15	0.568	0.45	130/120
2.20		0.72 x 0.65 x 13	15	0.780	0.45	130/120
2.80		0.84 x 0.73 x 13	15	0.993	0.45	200/80

*Flow rate at 1.0 bar **According to driplines inside diameter

Find out more

Please visit netafim.com.au.

Remembering Tony Biggs: A horticulture industry stalwart

A pioneer in leadership, education and communication has been lost to the Australian horticulture industry, with the unexpected death of Tony Biggs on 17 July 2021. Produce Marketing Australia Chief Operating Officer John Baker reflects on Tony's life, and his extensive service and contribution to Australian horticulture.

Tony Biggs. Image courtesy of Kelvin Tsui, Rabbit Photo (Richmond, NSW).

In his 40 years in Australia, Tony Biggs made a significant difference across a range of organisations and industries.

He and family moved from Kent in the United Kingdom – where Tony had been lecturing at Wye College – to Hawkesbury Agricultural College (now Western Sydney University's Hawkesbury campus) in 1980. He was appointed Head of the Department of Horticulture, before becoming Principal Horticulturist Vegetables with the New South Wales Department of Agriculture in the mid-1980s. He had a big impact at both organisations and their staff.

Upon his arrival in Australia, Tony had observed there was no dedicated national magazine for commercial production horticulture. In 1990, he helped establish and was founding editor of *Good Fruit & Vegetables*. Supported by his wife Frances, Tony produced over 200 issues in the next 13 years.

A communications trailblazer

Tony was an excellent communicator and had a particular flair in translating and editing scientific research and results into everyday language.

In a recent interview with the current editor of *Good Fruit & Vegetables*, he said the technical content of the magazine was based around news and stories on current research from around Australia and overseas. There was a major detailed monthly business article entitled 'Enterprise of the Month', along with interviews with national and international horticultural personalities, new product information and much, much more.

"I saw the technical content in being of paramount importance," Tony said.

He travelled extensively across Australia, seeking out stories and profiles in many diverse areas, building a wide network of colleagues and friends in the process. An annual highlight in the magazine were special features covering presentations from the Australian Horticultural Corporation's 'Marketing Edge' conferences, reaching a much wider audience and generating greater interest in marketing. This led to covering the Asiafruit Congress in Hong Kong and the United States' Produce Marketing Association Convention and Exposition on a number of occasions.

Concurrently, in 1991 Tony was appointed a Director of the Horticultural Research & Development Corporation – one of the forerunners of Hort Innovation. This was a position he held for nine years. Such was his contribution, Tony was asked to stay on the Board after completing the maximum allowable period of six years.

Industry impact

Through his family company Cardinal Horticultural Services, Tony undertook a range of other activities, usually in collaboration with Frances. He was the mushroom industry's R&D coordinator, including managing the new purpose-built facility at Sydney University. As well as seeing the need and being responsible for establishing the Australian Potato Industry Council, he and Frances provided the initial Secretariat.

His knowledge and experience of greenhouse horticulture and hydroponics in the UK – combined with collaborative research he undertook with Rick Donnan in Australia on the use of rockwool – led to major advances in the technology and its application. Tony was largely responsible for establishing the Australian Hydroponics Association (now Protected Cropping Australia) and providing the foundation Secretariat.

His experience and attention to detail made Tony a natural choice to review a range of horticultural programs. In addition, he was a significant co-contributor to a number of production and marketing projects in different parts of Australia and across industries.

Further achievements

Prior to arriving in Australia, Tony had written *Vegetables* – a practical reference book for gardeners that was published by the Royal Horticultural Society. Its ongoing popularity resulted in regular updates over succeeding decades.

His prolific writing continued in 1985, when he co-authored *Principles of Vegetable Crop Production*, published in the UK and distributed internationally.

Volunteering was in Tony's DNA. He was a strong believer in the Australian Society for Horticultural Science, as a founding member and president/co-president from 2000 to 2004. For many years, Cardinal Horticultural Services provided the Secretariat for the Australian Plant Propagation Association.

Tony would regularly address industry meetings and field days. He also undertook a number of volunteer projects in the Pacific and Asia, associated with communication and education.

Tony's service and contribution to Australian horticulture was justly recognised in 2004, when he was awarded the prestigious Graham Gregory Medal.


Agri Labour Australia Managing Director Casey Brown.

Finding a solution to the chronic farm labour shortage

The COVID-19 pandemic has had a debilitating impact on the country's agricultural sector, with crops going to waste while waiting to be harvested by a disappearing workforce. Agri Labour Australia Managing Director Casey Brown examines the variety of solutions being sought and implemented to address the nation's farm labour shortfall.

When global travel restrictions were introduced in March last year as a result of COVID-19, more than 150,000 backpackers were available in Australia to assist the agricultural sector.

By July – despite an April initiative that extended working holiday visas – the number had fallen to about 37,000 and a farm labour shortage was emerging as a major problem.

At the same time, unemployment hit 7.5 per cent – numbers not seen in Australia since the late 1990s.

Australia's $13 billion annual agricultural sector is traditionally dependent on overseas backpackers and interstate seasonal workers to harvest crops.

COVID drastically shrunk this workforce leaving fruit and vegetable growers across the country scrambling to find seasonal labour.

Initially the solution seemed obvious: unemployed people in urban areas could temporarily migrate to the country and work on farms as happened during the Great Depression.

But it wasn't that straightforward.

Solving the problem

Cash and other incentives to lure some of the thousands of Australians who lost their jobs because of COVID into the bush to do farm work have largely failed.

Many have family commitments and they're not transient visa holders, so can't just up and go and travel to the Northern Territory and work for four weeks. So, we're really talking about a small pool of Australians that actually have the ability to move out to a region and do a seasonal job.

It's a bit more complex than most people think. The Australian men and women who do take up the call – predominantly males – are just not seeing it through. They're lasting a number of days before quitting.

It's very much a mental thing as it is physical. For some, it can be too mentally and physically demanding and unfortunately they hang up the boots. We then have to re-recruit, and re-train.

It is so costly we've had to increase our resources by 34 per cent just to be able to manage the continuous retention issues that we've got with employing more Australians.

As COVID isn't going away any time soon, finding long-term solutions for the workforce shortfall is a high priority.

We are getting calls daily from existing clients and prospect clients asking, 'What do we need to do?' and 'How can we overcome it?'

One of Australia's largest agriculture companies can't attract candidates to their pulse business because they're employing them and then losing them to the renewable energies industry, which is paying considerably more.

To survive, businesses in the sector need to substantially increase their worker pay rates. They also need to give a more consistent number of hours to workers, and they need to try and provide some other levels of incentives. But it's still not going to be enough, because the candidates and the workers just aren't there.

The industry is well and truly trying to improve the pay conditions within the industry, but the workers are nowhere to be found.

We've got some growers that have increased their pay conditions by 10 to 20 per cent, including pay rates, incentives, free accommodation, but they're still not being able to attract workers because they're in a really remote regional location in comparison to other jobs.

The reality is, it's getting to a point where these producers are having to decide whether to stop planting or watch good produce go to waste because we can't give them certainty that we can provide labour for them.

Trying new things

Solutions are few and far between but it doesn't mean we haven't tried or will stop trying.

Our main strategy these days is focusing specifically on the end of the food supply chain, and manufacturing businesses in metro areas – because that's where the people are, so we know we can attract candidates there.

But for our regional businesses it's the opposite story, but there are still some industries that are attracting candidates such as the cotton and grain industries.

Next year is going to be one of the biggest cotton and grain seasons on record, and it's going to be a big challenge. Those types of agricultural jobs are probably the most attractive because they provide the most hours and consistency of work, but it's still

Justin Midson and Rhys Hensens from Agri Labour Australia on a site visit to a Tasmanian broccoli farm.

Agri Labour Australia workers and a farm owner.

very challenging to find candidates for those sectors.

The Pacific Labour Scheme and the Seasonal Worker Programme will play their part in addressing the candidate shortfall, but it's not going to come close to fulfilling the shortfall.

So, what is the solution?

In our view, there needs to be another bubble considered between countries that have a workforce that can fit multiple sectors, i.e., agriculture, tourism, hospitality, construction. Construction's booming at the moment; it was relying on a lot of backpackers as well.

Where there could be another opportunity is with the younger generation – the school leavers.

If we put together a good marketing campaign and strategy, and partner with some good industry bodies and good employers, hopefully we might be able to develop a new transient workforce that aren't on visas.

Engaging more grey nomads is another avenue we are exploring but because there is such a shortage, any good grey nomads are being looked after really well so they stay retained where they are.

So, we're finding they're not moving around as much as they traditionally did, which is limiting yet another labour source for various harvests – and the closing of borders hasn't helped that.

However, in Tasmania earlier this year, we had great success by partnering with not-for-profit organisation Anglicare to place some of their unemployed clients into work at a local broccoli farm.

The partnership has been incredibly beneficial for the organisation as well as the local Tasmanian agricultural industry.

Anglicare's youth development worker in Launceston noticed a lot of positive changes in the young people that worked on the broccoli farm, with many others asking for assistance in finding paid employment.

Looking ahead

We need to try and keep agriculture sustainable to ensure the opportunities can still be made available for next season and beyond.

The benefit in helping people build skills and relationships that can set them up for success is priceless.

Everyone understands that times are tough, but if we can continue to build this support and grow with it, the opportunities will keep coming and hopefully help more people in a positive way.

But in the race for labour, ensuring the safety, compliance, and protection of workers doesn't get missed should be top of mind.

We also need to encourage the broader community to support the industry that keeps food on the table and clothes on our backs, and ask the question to a friend or family member who is looking for work if they have considered agriculture as an option.

Not only would it support an industry that has supported Australians since our settlement days, but it would provide an experience that would have an impact far greater than you could imagine.

Find out more

Please call Agri Labour Australia on 1300 247 823 or visit agrilabour.com.au.

Ian Cook, Brad Ipsen and Brad Giles sample the freshly cut Twin Lakes produce.

Bayer Territory Business Manager Ian Cook and E.E. Muir & Sons Regional Manager Brad Giles pictured discussing disease management in broccoli at the Ipsen family's property near Manjimup in WA's south-west.

Winning the white blister battle in the west

High humidity levels combined with rainfall can lead to high disease pressure in vegetable crops. In this column, Western Australian broccoli grower Brad Ipsen discusses the fungicides that his operation uses to effectively combat devastating diseases such as white blister, which is known to occur in the state's south-west region during December and January.

Western Australian broccoli grower Brad Ipsen knows only too well the dangers of rainfall, high levels of cloud cover and humidity – hence the need for a good spray management program to safeguard his crops.

These very conditions presented at the family's Twin Lakes property near Manjimup in the state's south-west during the latest broccoli season.

The region sits in an 850-millimetre rainfall zone and even though this can vary by 150mm – generally downward in recent times – it can cause high disease pressure, particularly when humidity levels are higher during December and January.

"If we start getting cyclone cloud from the north-west resulting in high humidity and high temperatures – and because our plant density is around 47,000 plants per hectare – this lends itself to high foliage mass, and can lead to high disease pressure," Brad said.

He said white blister, which causes tiny white flowers on the heads that also reduce yield, was one of the major diseases Twin Lakes guards against. Soft rot and downy mildew also can be an issue.

"If unchecked, white blister can be very devastating and wipe out a whole planting. You need to have a good spray program in place," Brad said.

"We base our program around the use of Ridomil Gold® Plus, but the use of Infinito® has allowed us to come into crops with fungicide late.

"If you use Ridomil too late in the crop, it can change the colour in the head from green to brown, which is not attractive when you sell on appearance. If conditions are good, we also won't always use it – we will use something that's better tolerated by the crop."

Disease control

A Bayer product, Infinito® combines two active ingredients with different modes of action that provide excellent control of white blister and downy mildew at all key stages of their lifecycle. It offers an in-built resistance management solution for growers.

The liquid suspension concentrate formulation is quickly rainfast, highly systemic with strong translaminar activity and, importantly, has no withholding period.

"I always like liquid formulations – they are better to put through the boom. It is an easy liquid to measure, and it pours well. Some liquids don't stay in solution very well; they precipitate out, but this stays in solution very well," Brad said.

"I love the fact it has no withholding period in broccoli and allows disease control late in the crop – it has fit in our program well. Some other fungicides have three- to 14-day withholding periods.

"Another thing I like about it is that it's pretty compatible in a tank mix, so I can use it with a range of other products. It doesn't seem to interfere with anything else I want to put in."

The Ipsens use a UK-manufactured 24-metre Househam specialist vegetable sprayer with an air boom, applying Infinito several times according to conditions at 1.6 L/ha with an adjuvant to enhance adherence to plants and a typical water rate of 750 L/ha.

Brad said he was satisfied with the management of white blister using this fungicide.

"We'll keep using it. It's easy to use, cost-effective and it's repeatable and reliable. I know I can trust it."

E.E. Muir & Sons Regional Manager Brad Giles supports the Ipsens, and he said Infinito had found a strong fit in programs in combination with older fungicides still on the market, particularly for later crop stages.

"When crops are high and lush, this is perfect to use at that time. Activity from other products at that stage just isn't up to where this is at the moment," Brad said.

Find out more

Please visit crop.bayer.com.au/find-crop-solutions/by-product/fungicides/infinito-fungicide.

Cook2Connect: Tackling record levels of food insecurity and loneliness

A new campaign showcasing several of the Australasian region's iconic food and cooking brands is underway, with a line-up of the top chefs and foodies joining forces to encourage consumers to 'share a plate with a mate'. Coordinated by MGI Entertainment, #Cook2Connect is being led by Manu Feildel and will feature several brands – including Perfection Fresh – in a series of short films to be delivered across social media channels throughout September and October.

Perfection Fresh CEO Michael Simonetta.

Action is being taken to address record levels of loneliness and food insecurity in Australia, with a series of videos being released this spring.

Audiences will be inspired to share a meal with a loved one and make a donation to OzHarvest, Australia's leading food rescue organisation providing meals to those in need.

The vignettes will see the products brought to life as Australia's most-loved cooking icons bring viewers inside their kitchens, showing them how to prepare dishes that are meaningful to them, while they share the intimate memories behind the meals.

One of the campaign participants is Australian fruit and vegetable grower and supplier, Perfection Fresh.

This follows its participation in the successful #HomeCooked campaign, which also raised funds for OzHarvest in 2020. #HomeCooked generated almost four million media impressions and a social media reach of 544,200 for participating brands. It also allowed OzHarvest to deliver an additional 300,000 meals to Australians experiencing food insecurity.

CEO Michael Simonetta (pictured above) said Perfection Fresh was proud to be a part of the #HomeCooked campaign in 2020, so #Cook2Connect was a natural fit for the company in 2021.

"As an Australian family-owned business for over 40 years, the campaign aligns with our mission to inspire a healthier world by connecting people to sustainable fresh food," Michael said.

Perfection will be providing its fresh produce to inspire the chefs and influencers to create delicious dishes.

"We also plan to promote the campaign across our digital and social media channels to generate awareness and engage all Australians," Michael explained.

"We will continue to support OzHarvest with their ongoing work in food rescue and redistribution for those who need it most."

Consumption focus

Michael stressed it was important for the entire horticulture industry to promote the consumption of fresh produce and personal connection at a time when consumers need it most.

"Fresh produce and healthy food play a critical role in contributing to our physical and mental wellbeing. Inspiring all Australians to connect with each other through healthy food whether in person or remotely is relevant now more than ever.

"I am sure the industry will continue to overcome barriers presented by the pandemic, ensuring that regional communities continue to thrive, and all Australians have access to healthy Australian produce."

Throughout September and October, all horticultural growers and marketers are able to take part in the #Cook2Connect campaign through creating and sharing content using the campaign hashtags across their social media platforms.

Meanwhile, Perfection Fresh will continue to support similar campaigns and initiatives.

"During this time when lots of Australians are doing it tough, we continue to support communities and charities – like OzHarvest – that help to ensure access to food for themselves and their family. Over 710,000 Australians rely on food relief each month, and one quarter are children," Michael said.

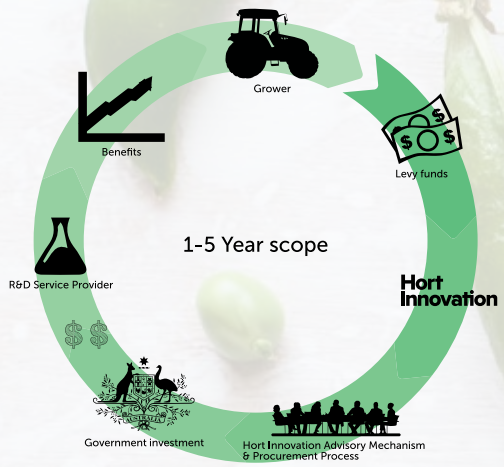
"To donate, readers can head to the OzHarvest website. Every dollar donated provides two meals."

Find out more

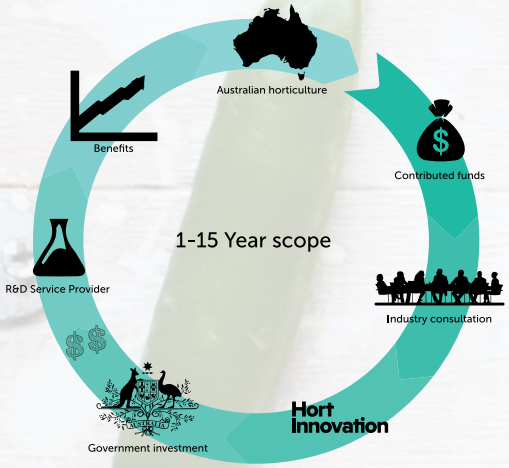
To donate to OzHarvest, please visit ozharvest.org.

THE VEGETABLE R&D LEVY AT WORK

STRATEGIC LEVY INVESTMENT



HORT FRONTIERS



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

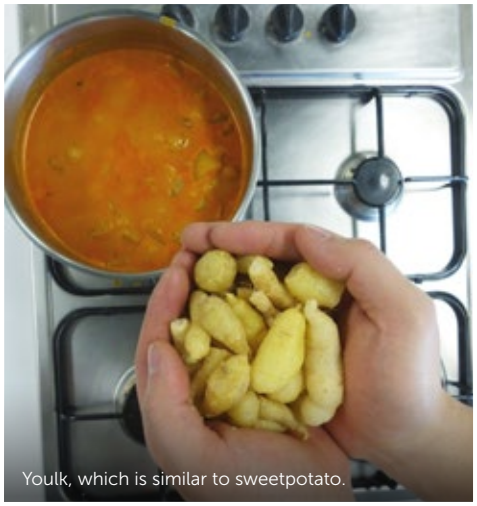
Hort Innovation vegetable fund investments (levy projects)
Ongoing investments 2020/21

Project code	Delivery partner	Project title	Project lead contact details	Project description
VG20003	Department of Agriculture and Fisheries, Queensland	Co-developing and extending integrated Spodoptera frugiperda (fall armyworm) management systems for the Australian vegetable industry	Dr Siva Subramaniam: siva.subramaniam@daf.qld.gov.au	This project will support the rapid co-development of an integrated fall armyworm management strategy that will deliver better outcomes for those regions currently affected by fall armyworm as well as for those regions that may experience an incursion in the future. This investment seeks to provide the support needed by the Bowen, Burdekin, Gumlu and Lockyer Valley vegetable industries, their advisory networks, support industries and researchers to capture, develop and use their experience of managing FAW on-farm during the 20/21 and 21/22 seasons. Through this investment, the vegetable industry will work closely with researchers to identify management gaps and trial a range of strategies on-farm. Outcomes from these trials will be shared with the Australian vegetable industry and will inform future fall armyworm research investments. This investment will work closely with project *Identifying potential parasitoids of the fall armyworm, Spodoptera frugiperda, and the risk to Australian horticulture* (MT19015). See below for further details.
MT19015	Department of Agriculture and Fisheries, Queensland	Identifying potential parasitoids of the fall armyworm, Spodoptera frugiperda, and the risk to Australian horticulture	Dr Siva Subramaniam: siva.subramaniam@daf.qld.gov.au	This project was established in early 2021 to examine potential parasitoids of fall armyworm and deliver extension materials to growers on how to effectively manage the pest. The research team will identify parasitoid species present in horticultural crops and provide recommendations on potential candidates for future biological control of fall armyworm, as well as local information on established locations, host range, infestation levels on horticultural crops and damage patterns. The research aims of this project are to: • Conduct a comprehensive literature review on fall armyworm parasitoids and biological control. • Undertake an economic risk analysis for relevant horticultural crops in Northern Australia. • Conduct field survey and crop samplings to study FAW host plants and its endemic parasitoids. • Develop and deliver extension materials to assist growers.
MT19014	Victorian Department of Jobs, Precincts and Regions	Field-based testing for fall armyworm	Mark Blacket: mark.blacket@agriculture.vic.gov.au	The Department of Agriculture, Water and Environment (DAWE) recently funded the development of a rapid molecular test for use in the field for early detection and identification of fall armyworm. This short investment will conduct the second phase of this research to foster national collaboration in monitoring the movement of fall armyworm through the provision of a quick and accurate test with standardised protocols for use. The project is: • Facilitating the rapid identification of fall armyworm in regional Australia through in-field testing across multiple horticultural areas. • Increasing awareness of in-field testing in regional Australia, especially northern Australia. This includes engaging with biosecurity and growers to demonstrate the testing. • Improving knowledge of technological requirements in regional Australia to allow the rollout of this technology for fall armyworm detection and surveillance.
VG16037	The University of Queensland	Novel topical vegetable, cotton virus and whitefly protection	Professor Neena Mitter: n.mitter@uq.edu.au	Beginning in 2018 and due for completion in 2021, this investment aims to minimise the economic impact of pest infestation on vegetables (and on cotton) through the development of an innovative topical protection medium, BioClay. The high-tech BioClay spray is anticipated to prime the plant's own defences, similar to how a vaccine works, helping the plant to naturally attack specific crop pests and pathogens. The project has a range of co-investors, including the Cotton Research and Development Corporation.

Project review: Putting Asian, Australian indigenous vegetables on the plate

Asian and Australian indigenous vegetables were the focus of a levy-funded project that was undertaken from 2016 to 2018. This project was tasked with identifying commercially viable Australian indigenous vegetables and Asian vegetables; assessing their consumer appeal through a range of consumer interactions, including sensory testing; and providing recommendations for industry to ensure the greatest likelihood of success in the market.

Sample preparation at the sensory facility. Images courtesy of Dr Denise Hamblin.



Youlk, which is similar to sweetpotato.

In 2016, independent market research agency Colmar Brunton – now Kantar Australia – commenced a project that was designed to identify commercially viable Australian indigenous vegetables and Asian vegetables.

A strategic levy investment under the Hort Innovation Vegetable Fund, *Understanding Consumer Triggers & Barriers to Consumption of Australian Indigenous Vegetables & Asian Vegetables* (VG15071) was also designed to determine those vegetables that hold the greatest appeal to Australian consumers, and provide recommendations to lead to the greatest likelihood of success in the market.

A multifaceted approach was implemented to ensure knowledge was built upon at each stage and the research objectives were met. This approach included a knowledge audit and review; a qualitative deep dive; a quantitative validation; sensory optimisation; and an action plan for opportunities and recommendations.

Identifying veg

Dr Denise Hamblin is a sensory and consumer insight specialist who led the Colmar Brunton project team. She explained the multifaceted approach that was used.

"We started with a huge list of Asian veg and indigenous veg and herbs, and were able to use those different stages of the research to whittle down to the pointy end as to the ones we were going to put in front of the consumers for sensory evaluation," Dr Hamblin said.

Researchers identified the top five indigenous and the Asian vegetables to put through sensory testing.

"We were able to prepare and bring these vegetables to life, putting them in front of consumers to see how they responded," Dr Hamblin said.

"As an example of that, we had lemon myrtle biscuits. We also had youlk – similar to a traditional sweetpotato – featured in a salad as well as in a curry. This showed the different ways of utilising these commodities and putting them in front of consumers to see how they responded to them."

The sensory testing elicited overwhelmingly positive responses from consumers.

"We'd been working with sensory evaluation for 30 years, and some of these dishes were getting the highest scores we've ever seen," Dr Hamblin said.

"It was really exciting for us to then translate the potential of that back to Hort Innovation."

Overcoming challenges

Although the project was successful in identifying the great opportunity and much potential around commercialising and expanding the distribution of Asian and Indigenous vegetables in the Australian market, the project team identified lack of supply as a barrier to consumption.

"You can have all the potential in the world, but if you're not available and consumers don't know you exist – let alone the benefits, the taste, the functionality and the convenience – you can never realise that potential," Dr Hamblin said.

"It was so difficult to get product, and I remember it was in the dying hours in the lead-up to the sensory test when the product arrived. We had one small plastic box of the youlk that arrived. It was exciting to see it, but it emphasised some of the greatest challenges in availability.

"The interest is high, and the potential is great, but the availability is challenging. We had to collaborate with others through the supply chain and within the industry to gain access to some of those ingredients to test."

Dr Hamblin pointed to cultural differences as a barrier, particularly when looking at the indigenous vegetable commodities.

"They have been grown out of indigenous communities by the local people. There wasn't a huge appetite from the national retailers or any big brands to come in and try to intrude on that or to replace the supply of that – there was a cultural sensitivity in play," she said.

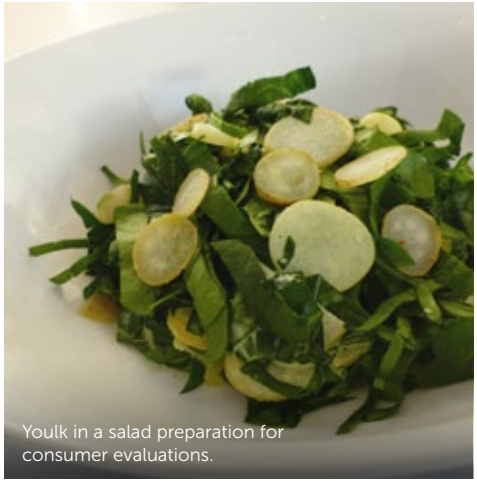
"There is also a commercial barrier. For example, with youlk, they were contacting us a couple of months out saying, 'If the weather is like A, B and C, we should have X amount for you. But if it doesn't rain or we get some flooding, we're going to have nothing.' Small, sensitive supply, and a supply chain that hasn't been well-established, meant that it was a little tricky to access."

Further potential

In recent years, Dr Hamblin and her team have been working with Millennium Monitor, a program that keeps track of where social values sit. It looks at the implication of evolving social values on diet types and different types of products, as well as brands and communication.

Since project VG15071 started five years ago, Dr Hamblin said consumer desire for trying new things, and use functional ingredients and products, has intensified.

Youlk in a curry preparation for consumer evaluations.



Youlk in a salad preparation for consumer evaluations.

"We're seeing this huge increased halo around health – not just physical health, but mental health. People are looking for these natural supplements or food or ingredients that they can work into their everyday life to help empower them to solve these types of challenges and aspects in their lives," she said.

"We know that is continuing to grow. It plays so beautifully into the potential of these types of indigenous vegetables – some of them do have that functional or health-related benefits, plus they are new and different, and come from Australia.

"We've got such a provenance in local urban trends evaporated by COVID and that means that the potential that we saw in 2016 is likely to be even higher. The trends and the evolution of consumers themselves are only playing into more potential in this space. This [the project and its findings] is still as relevant – if not more relevant – in terms of what consumers are looking for."

Key insights and recommendations

The Colmar Brunton (now Kanter) project team highlighted several points around Asian and Indigenous vegetables following the completion of project VG15071.

1. **Availability:** The prevalence of these vegetables should be encouraged and facilitated in Australian Food Service and Manufacturing based on relevant consumer trends of functional health, provenance and indigenous ingredients. This should lead to a greater consumer demand and broader availability in retail.
2. **Naming convention:** Trial and entry to repertoire will be aided by appealing names such as those that describe the sensory experience (sweet mild radish) or clarify the origin (Australian-grown Gai Lan).
3. **Education and familiarisation:** Consumers have limited knowledge when it comes to some of the vegetables. Information regarding the expected taste and texture, as well as cooking styles and recipes, will be essential. Comparing the vegetable to similar tasting vegetables will lift consumer confidence around incorporating them in their cooking.
4. **Communicating unique health benefits:** Highlighting the health and nutritional benefits of each vegetable is congruent with health trends and provides a strong reason for purchase beyond current vegetable repertoires.
5. **Reaching younger consumers:** Consumers aged 10-25 were highly engaged with these indigenous and Asian vegetables, found them appealing and expressed the desire for them to be purchased. However, this study reveals that parents are potentially acting as gate keepers, more reluctant to purchase new vegetables for themselves and their family. Further research should be conducted into understanding this barrier to children's vegetable consumption.

Find out more R&D

Please contact Dr Denise Hamblin at denise.hamblin@kantar.com.

The final report for this project is available on InfoVeg. Readers can search 'VG15071' on the InfoVeg database: ausveg.com.au/infoveg/infoveg-database.

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

Project Number: VG15071

Hort Innovation Strategic levy investment | VEGETABLE FUND

Planting a leek crop.

A stale seed bed, ready for crop planting.

Weed seed bank management using stale seed beds and inter-row cultivation

The team from the Hort Innovation-funded *project A strategic approach to weed management for the Australian vegetable industry* visited Schreurs & Sons in Clyde, Victoria in late-2019. In this article, Adam Schreurs speaks to the team about his willingness to innovate in Integrated Weed Management and improve his weed management approach by reintroducing some tried and trusted methods.

About Schreurs & Sons

The Schreurs family has been growing vegetables in the Cranbourne district, approximately 50 kilometres south-east of Melbourne, since the 1950s. Originally renowned for introducing Dutch carrots into the Australian market, Schreurs & Sons has now diversified into growing a variety of vegetable crops. These include celery, leek, spinach, rocket, and snow pea tendrils.

Today, Schreurs & Sons own five farms in the outer Melbourne suburbs of Clyde and Devon Meadows, totaling approximately 550 hectares. Across these farms, approximately 400 hectares are dedicated to vegetable production. The business employs about 180 staff, rotating across the five farm sites depending on need for ground preparation, planting and sowing, crop management, and harvest activities.

Adam Schreurs is one of several third-generation members of the family to remain involved in the business, and operates the business alongside his cousins Chris and Ben Schreurs.

Weed management concerns

Until the late 2000s, the weed management strategy used by Schreurs & Sons relied heavily on regular and relatively deep cultivation passes during the post-harvest and fallow period; a range of pre-plant and post-plant selective herbicides registered

for use within their various crops; hand weeding to follow up on surviving weeds; and chemical fumigation.

However, for a variety of reasons the Schreurs & Sons team decided to change their weed management approach:

- Adam and his team became concerned about reduced herbicide effectiveness among the limited range of options available to them, noting a particular problem in managing common groundsel (*Senecio vulgaris*).
- Rather than employing their previous 'calendar spraying' approach, the team considered it would be more effective to use herbicides strategically and supplement them with other methods.
- As herbicides were becoming less effective, the team observed that cultivation and especially hand weeding costs were increasing. Diversifying the weed control methods used had the potential to reduce these costs over time.
- Reducing the number of relatively deep cultivation passes during the winter fallow period was also an attractive option, to maintain and improve soil health and structure.
- Adam and his team wished to move away from chemical fumigation due to concerns regarding its negative impact on human, animal and soil health.
- Schreurs & Sons is interested in shifting at least some of its land into organic celery production in the longer-term. Looking at ways to reduce the business' reliance on herbicide therefore provided an opportunity to determine how effective alternative techniques may be.

Prior to the emergence of selective herbicides, the operation had relied heavily on cultivation and bed management before, within and after crops. The issues outlined above led them to consider reintroducing these techniques.

A new approach using old methods

As a result, since the late 2000s Schreurs & Sons has grown to rely more heavily on stale seed beds and inter-row cultivation as options for reducing reliance on regular herbicide application, and potentially reducing the cost of other weed management activities such as hand weeding. Subsequently, both methods have also become increasingly important in compensating for reduced herbicide effectiveness noted on the farm.

A stale seed bed involves preparing the crop beds well before the crop is planted. Several cohorts of weeds are allowed to germinate in the beds and controlled early each time using the broad-spectrum herbicide glyphosate. Usually, the seed bed is irrigated once to encourage a flush of weed germination. Glyphosate is applied to the beds approximately four weeks after the bed has been formed, to control any weeds that have emerged. Additional weed flushes are controlled if time permits. The crop is then planted into clean beds. Soil disturbance is minimised during planting to limit further weed germination.

This method suits the large scale of Schreurs & Sons production system, which features a winter fallow period between crops. This period is long enough for multiple cohorts of weeds to germinate and be controlled in the formed beds using the stale seed bed technique, before the next crop is sown or planted.

A stale seed bed, ready for crop planting

Inter-row cultivation suits many of the crops produced by Schreurs & Sons, which are grown in rows along the crop beds. In addition to removing many weeds within the crop row and in the wheel tracks, inter-row cultivation implements may provide some 'hilling' of the soil, potentially covering and suppressing other recently germinated small weeds.

Schreurs & Sons has two implements available to carry out inter-row cultivation. The first of these is a 'Weedfix' cultivator, using rotating tines. The second is a customised cultivator – fitted with Dutch hoes and knives – that has been set →

A customised inter-row cultivator, set up to the specific bed and row spacing used on the farm. The cultivator is being used within a more mature leek crop to cultivate within the crop bed as well as the wheel tracks.

up specifically to suit the bed and row spacing used on the farm.

A customised inter-row cultivator, set up to the specific bed and row spacing used on the farm. The cultivator is being used within a more mature leek crop to cultivate within the crop bed as well as the wheel tracks.

Both implements allow cultivation of the crop bed between the rows of crop plants, as well as on the sloped sides of the raised beds. Shallow inter-row cultivation is also completed within the wheel tracks by Adam and his team, using the customised cultivator.

The team usually uses inter-row cultivation twice, at least four weeks prior to harvest, and generally to a depth of 30 to 40 millimetres. The Weedfix cultivator is used within less mature crops, and the customised cultivator is used within more mature crops.

Among the crops grown on the farm, celery and leeks are particularly suited to inter-row cultivation because of their relatively upright form. However, inter-row cultivation is used to varying degrees within all crops grown by the business.

Schreurs & Sons continues to rely on several other weed control methods as part of its overall IWM strategy. These include cultivation to form crop beds, pre-plant and post-plant herbicides, and hand weeding to remove weed survivors.

Benefits of the new approach

The key principle of the Schreurs & Sons, strategy is to minimise the number of weeds that mature and produce seed – particularly those weed species which they believe have started to show signs of resistance to herbicide. No matter what IWM approach is used, this principle is applicable to all vegetable farms.

Introducing stale seed beds and inter-row cultivation into the IWM strategy has successfully compensated for reduced herbicide effectiveness and helped Schreurs & Sons to gradually reduce the weed seed bank. Their ability to use herbicides more strategically helps to manage the risk of herbicide resistance. Reduced tillage during the winter fallow and during bed formation has been beneficial for soil health and soil structure.

Despite initially being slightly more expensive than the former, more herbicide-reliant strategy, the IWM strategy now used by Schreurs & Sons has helped improve overall farm profitability. This is due to improved crop yield and quality, reduced processing costs, and gradually reducing weed management costs as the weed seed bank is depleted.

Limitations of the new approach

Using the stale seed bed method successfully requires a sufficiently dry paddock to be able to drive the tractor along the crop rows while spraying glyphosate. If the paddock is wet for an extended period, it may be possible for weeds to establish and produce seed. This is particularly important for weeds that are capable of germinating, growing and producing seed rapidly. Therefore,

Adam Schreurs from Schreurs & Sons (left) chats to Carl Larsen from RM Consulting Group.

relying on stale seed beds comes with a risk of replenishing the weed seed bank in particularly wet conditions.

Timing of inter-row cultivation is critical. This method is most effective when it is carried out early in the life of weeds – ideally, when weeds have just reached their first true leaf stage. Waiting until weeds have had the chance to grow much larger than this can reduce the effectiveness of this method. Because inter-row cultivation utilises shallow tillage, larger weeds may not be removed from the soil. Other issues resulting from late inter-row cultivation may include more mature weeds attaching themselves to the tines and re-establishing elsewhere in the paddock, and damage to the crop resulting from larger weeds dragging clods of soil through the crop lines.

Innovation is key

Adam's willingness to innovate and continually explore new approaches, or to re-introduce 'old' approaches that are known to work well if used appropriately, is one of the keys to Schreurs & Sons ongoing success, not only in weed management but across the business.

With regards to weed management, Adam remains keen to explore alternative options despite the current success of the IWM strategy in place for Schreurs & Sons. Some options that have attracted his interest include cover cropping to suppress weeds during the fallow; thermal weed management (steam, flame or microwave); and a one-off chemical fumigant application to consider as a last resort to deplete particularly heavy weed seed banks.

Carl Larsen from RM Consulting Group is involved in *the VegNET – Victoria* (VG19012) and *Soil Wealth ICP Phase 2* (VG16078) projects, among others. Carl considers Adam's continued willingness to innovate will allow Schreurs & Sons to keep their weed burden to a manageable level in the longer term. His approach to innovation is suitable to all vegetable farms.

Further information

If you would like to learn more, a case study document is available for download from the project web page: une.edu.au/iwmvegetables. Other weed management resources may also be downloaded.

You can also watch two videos with Adam Schreurs and Carl Larsen, discussing the Schreurs & Sons approach to on-farm innovation and IWM:

- Innovation in IWM: youtube.com/watch?v=b0kIY5VRwR8
- Weed seed bank management: youtube.com/watch?v=9nLgUcX-xUU

The VG15070 project team is grateful to Adam Schreurs and his team at Schreurs & Sons for sharing their story of successful Integrated Weed Management, and for their support of this project. We also appreciate the support of Carl Larsen from RMCG who shared his thoughts on innovation in IWM and vegetable farm management.

Find out more R&D

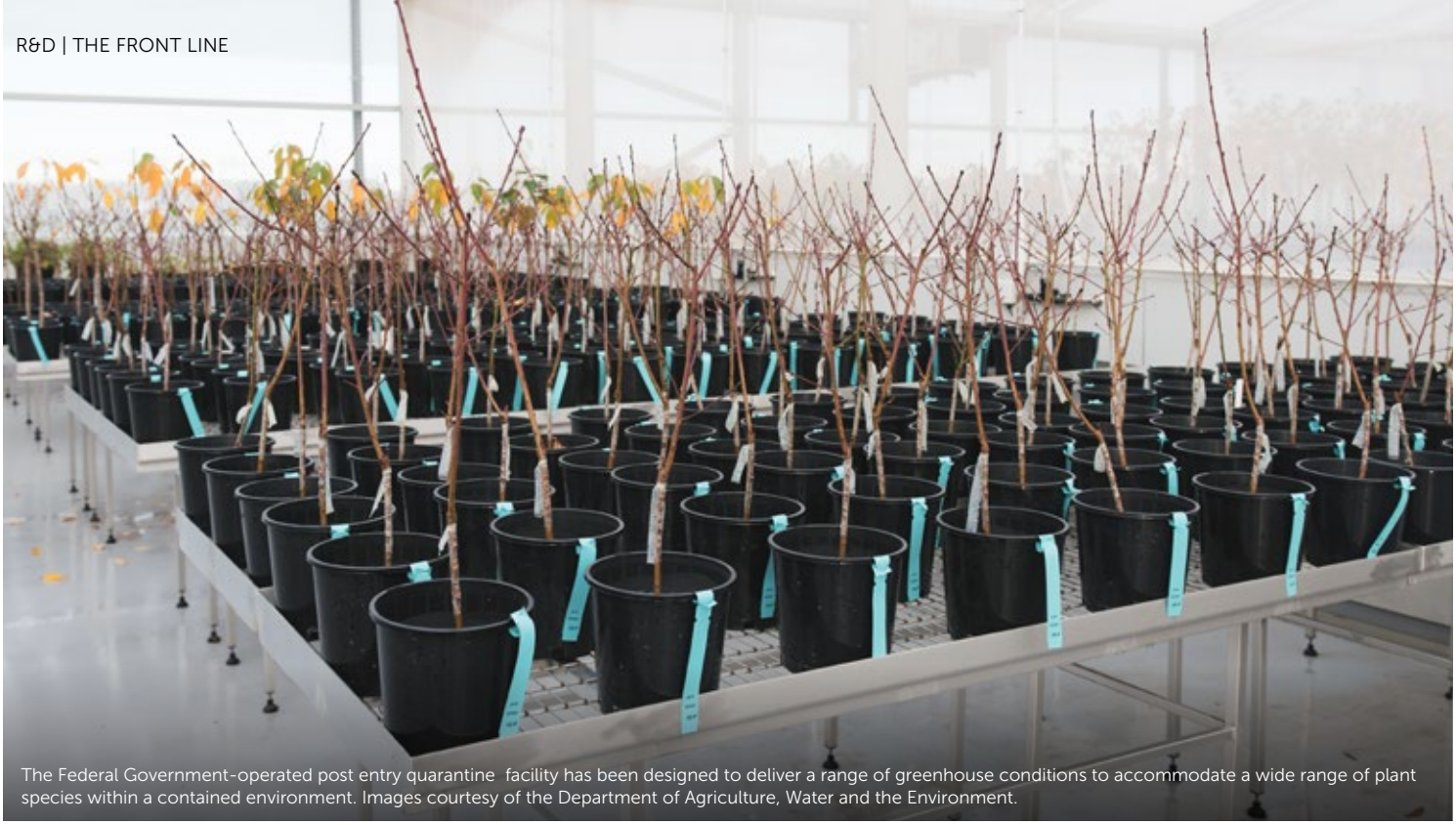
Please visit une.edu.au/iwmvegetables or contact Michael Coleman at Michael.Coleman@une.edu.au or Paul Kristiansen at Paul.Kristiansen@une.edu.au.

A strategic approach to weed management for the Australian vegetable industry (VG15070) 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: VG15070

Hort Innovation Strategic levy investment | VEGETABLE FUND



The Federal Government-operated post entry quarantine facility has been designed to deliver a range of greenhouse conditions to accommodate a wide range of plant species within a contained environment. Images courtesy of the Department of Agriculture, Water and the Environment.

Inspecting the front line of Australia's border security

Biosecurity plays a critical role in allowing Australia to remain free from many harmful plant pests, diseases and weeds that exist overseas. Australia's biosecurity controls are fundamental to protecting the horticultural commodities from pests and diseases. In this edition, AUSVEG Biosecurity Officer Zali Mahony goes behind the scenes at the Federal Government-operated post entry quarantine facility in Melbourne's north.

Biosecurity describes a series of measures designed to protect individual farming properties, businesses and the nation from the entry and spread of exotic pests.

Australia employs a 'biosecurity continuum' to protect our agricultural industries from the introduction of harmful, unwanted plant pests, diseases and weeds while working to sustain and develop valuable export markets. Strict and regulated restrictions are in place offshore, and at Australia's border and post-border entry, to reduce the risks of imported plant material to Australia's agriculture sector.

Any plant material entering Australia must comply with our import conditions that are in place offshore and at Australia's border. The Federal Government's post entry quarantine (PEQ) services for plants and animals are consolidated into a single facility in Mickleham, a suburb in Melbourne's north.

New arrivals of plant pests and diseases can significantly impede Australia's horticultural industries by reducing yields and produce quality, increasing production costs, and restricting access to international markets.

Adrian Dinsdale is the Assistant Director of the Plant Innovation Centre at PEQ. He says biosecurity is critical to Australia in maintaining its highly favourable trading status.

"Australia's absence of many of the world's most damaging pests and diseases is a significant enabler in maintaining this status," Adrian says.

Acting Director of Plant Import Operations, Lisa Jennaway, adds that biosecurity underpins the country's unique flora and fauna.

"It forms one of many pillars for agricultural productivity by allowing the production sector to access clean germplasm and new varieties that are free from pests and diseases of biosecurity concern," she says.

Plant protection starts offshore

Imported planting materials can potentially carry economically and environmentally significant pests, diseases and weeds that could enter and establish in Australia.

Australia employs strict import conditions for any plant material, including live plants or seeds entering the country, which are outlined in the Biosecurity Import Conditions system (BICON). Import conditions are different for each plant species and are determined by the biosecurity risks posed by the goods.

"Import conditions for plants and seeds can vary depending on the plant species being imported; the biosecurity risks they pose; where it is being imported from; and the form of the material that is being imported. This includes tissue culture, seeds, budwood and bare-rooted plants," Lisa says.

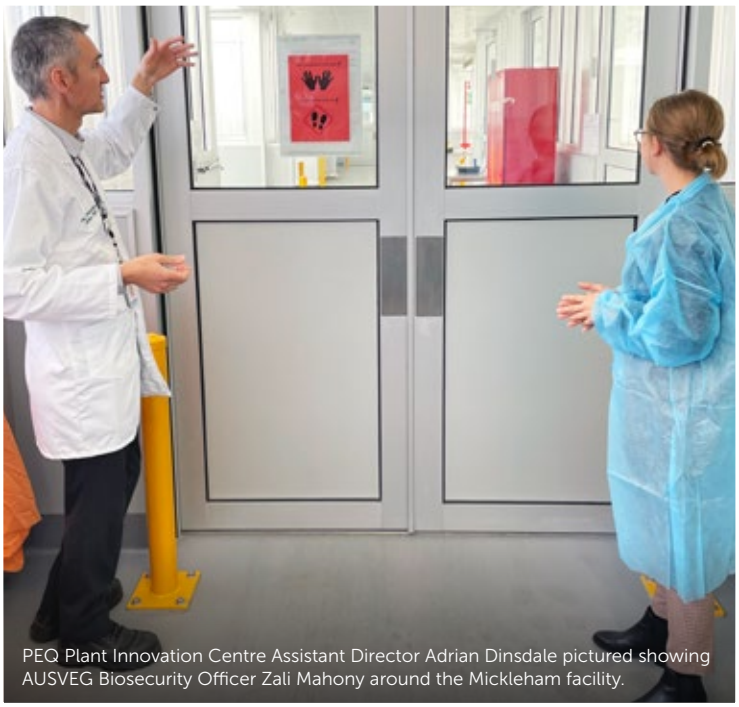
These import conditions may require an import permit being obtained before the goods arrive in Australia; certification and packaging requirements that are required prior to export; and specific on-arrival and post-entry requirements.

"Import permits allow the government to assess the level of risk posed by the plant species proposed for import and consider the conditions that would be necessary to reduce this to an acceptable level of protection," Lisa explains.

Border control

The next stage in Australia's biosecurity

At the border, DAWE biosecurity officers screen incoming mail, passengers and cargo for goods that pose a biosecurity risk, such as live plants and planting material.



PEQ Plant Innovation Centre Assistant Director Adrian Dinsdale pictured showing AUSVEG Biosecurity Officer Zali Mahony around the Mickleham facility.

continuum occurs at the border and involves measures that successfully lower the risks of plant material arriving in Australia. Any plant material arriving in Australia is inspected by biosecurity officers to ensure material is free from unwanted pests, disease symptoms or contaminants.

"In some cases, the material may need to undergo testing, treatment or further disease screening at approved sites before they are released," Lisa says.

This is where the PEQ facility operates within Australia's biosecurity continuum, as it manages biosecurity risks by growing high-risk plant material in containment facilities and identifying any exotic pests or diseases present. Like import permits, PEQ operates on the risk profiles of imported plant material.

"Some tissue culture is simply inspected and released at the border, whereas high-risk material can spend over 12 months in post entry quarantine," Adrian says.

Arrival of planting material

The Federal Government's Department of Agriculture, Water and Environment implements a wide range of different strategies, and has adopted necessary regulatory controls to minimise and manage potential biosecurity risks of imported planting material.

Seeds often undergo inspection and – for some seed species – pathogen testing at an approved laboratory. There are two accredited seed testing providers in Australia: Plant Health Diagnostic Service (operated by the New South Wales Department of Primary Industries) and Crop Health Services (Agriculture Victoria).

Upon arrival at PEQ, the plant material undergoes inspection by a plant pathologist and horticulturalist to ensure the imported material is: 1.) in good health; 2.) free of pests and diseases; and 3.) meets the conditions of the relevant import permit.

With imported budwood or cuttings, a small sample of plants are selected as index plants to progress through to further PEQ testing. Here, the index plants are rigorously screened for a variety of exotic plant pests and diseases. Before this happens, all plant material undergoes mandatory pest and disease treatment (e.g., bleach, insecticide, hot water), which varies depending on plant species.

"Plants are managed based on their risk profile. This includes their origin and what pests and diseases they can host, rather than what species they are," Adrian says.

"For instance, the Department currently recognises one high health source in Scotland for potato tissue cultures, which conducts all required testing before these plants are exported to Australia.

"These high health plantlets would only need to undergo PEQ in Australia for half the time that is normally required for the same crop from other providers, and they don't need to be tested again in Australia if the test had already happened offshore."

In addition to this, how and when imported plant material is tested is a result of a variety of additional factors. These include plant species, life stage, country of origin, growing season and the parts of the plant that tend to accumulate higher disease loads.

"Leaves are the most common tissues sampled for testing but sometimes we target roots, the central leaf vein or other tissues," Adrian says.

Shared responsibility

Biosecurity is a big job, and vigilance must be maintained. Biosecurity is everybody's responsibility and we all play a role in upholding Australia's favourable status – free from many of the world's most devastating plant pests and diseases.

"Before you import, it's imperative that you take time to understand and ensure that you can comply with all of Australia's import conditions," Lisa says.

For growers, the best chance at stopping the spread and establishment of exotic pests is to be biosecurity aware and report anything unusual via the Exotic Plant Pest Hotline on 1800 084 881.

Find out more R&D

Please contact the AUSVEG Extension & Engagement Team on 03 9882 0277 or email science@ausveg.com.au. The Farm Biosecurity Program is funded by the Plant Health Levy.

Peter Wadewitz.

Peats Soil & Garden Supplies' Brinkley site.

Peats Soil & Garden Supplies' 6mm new composted soil conditioner granules.

Feed your soils to feed the world: Supporting soil health in vegetable production

The Soil Wealth and Integrated Crop Protection (ICP) project works with growers nationally to put soil management and plant health research into practice. In this column, the team speaks to South Australian industry stalwart Peter Wadewitz about the importance of healthy soils, building organic matter and strengthening soil structure to produce a better crop. *Soil Wealth ICP Phase 2* (VG16078) is a strategic levy investment under the Hort Innovation Vegetable Fund.

It's rare to come across someone who is as passionate about soil health as Peter Wadewitz.

The founder and Managing Director of Peats Soil & Garden Supplies has dedicated the last 45 years to supplying compost, mulches and recycled organic resources to the horticulture, landscape and garden supplies industries in South Australia and interstate. The business operates on four sites across South Australia and recently expanded its presence to Darwin, South Africa and Qatar.

For Peter, it all starts with talking to growers about healthy soils, building organic matter and strengthening soil structure to produce a better crop.

"I think we've overused fertilisers and chemicals for so long and let the quality of the soil run down, which is probably why we don't get as many good results due to poor and unhealthy growing practices," he explains.

"If nature can't break down a product, we should be questioning whether we use that product in the first place."

While many growers are becoming increasingly aware of the role that soil health plays in a productive and sustainable vegetable growing operation, Peter says it is a topic that must be continually discussed and supported by the wider industry.

"I've spoken to growers who have no idea about organic matter or cation exchange capacity and what it does to the soil. A lot of the issues that growers are dealing with could potentially be overcome with a good healthy soil that produces a stronger, healthier plant.

"Some of the results we are getting are just unbelievable. We did a trial in Virginia with Soil Wealth ICP team member Doris Blaesing and the differences we saw in the colour of the broccoli was incredible, just from being grown in good healthy soils."

Continual improvement

Peats is conducting a range of trials to improve product performance and the impact on vegetable and potato production. This includes investigating the effect of adding biochar, as well as granulating and pelletising products and blending them with organically certified resources, which could potentially help growers achieve carbon credits.

"The bottom line of these trials is to grow a healthier plant with a bigger root system, that builds more carbon in the soil, that grows a bigger top, that sucks more carbon dioxide out of the atmosphere and stores more carbon in the soil. That's your circular economy, but we have a long way to go to get that right," Peter says.

"Our products aim to prime the soil to start the circular economy and get a healthy soil moving. It's what nature has been doing for millions of years.

"We should also be mindful that we push

products that come in the gate up the value chain. If we redirect organic waste from landfill to agriculture, take 50 per cent less inputs through the farm gate and have a better quality product, we'd be far better off."

For growers, Peter has one simple piece of advice when it comes to boosting soil health.

"Whether it's compost, mulch, biochar, green cropping – adding one tonne is better than nothing, and consistently adding it is the key.

"You need to feed your soil – don't ever stop doing it because it's a living thing. If you keep taking from it and don't put anything back, you'll have a very poor, unhealthy soil and product."

Further support and reading

- Organic soil amendments global scan and review: soilwealth.com.au/resources/global-scan-and-reviews/organic-soil-amendments
- The 'breakdown' on composts fact sheet: soilwealth.com.au/resources/fact-sheets/soil-nutrition-and-compost/the-breakdown-on-composts

Peats Soil & Garden Supvplies is a member of the Soil Wealth ICP Partnership Network, which aims to actively build industry capacity and grower understanding of current and future innovations in products, technologies and services. To find out more or join the network, visit soilwealth.com.au/about-us/join-the-partnership-network.

Check out the latest resources from the Soil Wealth ICP project

The Soil Wealth ICP team recently released some useful resources to help vegetable and potato growers improve their management of soils and plant health. Take a look below or explore the full range of resources at soilwealth.com.au.

Case study: Boosting mycorrhizal fungi in vegetable crops

The vegetable industry has a growing interest in soil health and beneficial soil microbes, including mycorrhizal fungi. This case study examines why and how growers can boost mycorrhizal fungi in their crops, and shares the results from a trial which looked at the potential of cover crops to increase the beneficial fungi in vegetable crops.

Access the case study: soilwealth.com.au/resources/case-studies/boosting-mycorrhizal-fungi-in-vegetable-crops

Demonstration site update: Richmond, Tasmania

The Soil Wealth ICP demonstration site in Richmond, southern Tasmania was hosted by Harvest Farms.

In 2018, a trial was established to examine the costs and benefits of quality compost as an organic soil amendment on babyleaf spinach crop yield and quality. The key findings and conclusions from the three-year trial are now available: soilwealth.com.au/resources/case-studies/demonstration-site-trial-full-report-richmond-tasmania

Global scan and review: A guide to preventing leaf and stem diseases

Plant diseases are caused by living organisms feeding on plants and damaging them in the process. Knowing the optimum conditions for infection and disease spread is the first step in disease prevention and control. This guide gives an overview of plant diseases, general methods of transmission and the conditions that foster key diseases of aboveground vegetable plant parts.

Access the guide: soilwealth.com.au/resources/global-scan-and-reviews/a-guide-to-preventing-leaf-and-stem-diseases

Webinar recording: Using drones to generate farm insights

Do you use a drone on your farm? Watch this webinar to find out more about the legal requirements for drone operators and how they can help growers manage daily challenges on-farm, including weed control.

Access the recording here: soilwealth.com.au/resources/webinar-recordings/using-drones-to-generate-farm-insights-drone-basics-and-operations-including-weed-mapping

Find out more R&D

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

Minor use permits

Permit Number	Crop	Pesticide Group	Active	Pest/Plant disease/ Target weed	Date Issued	Expiry Date	Permit Holder	States
PER90928	Various vegetables, culinary herbs and ornamentals – nursery (non-bearing). Please refer to the APVMA website for full list.	Insecticide	Spinosad	Leafminers (*Liriomyza* spp.) including: vegetable leaf miner *(Liriomyza sativae), pea leaf miner/ serpentine leaf miner (Liriomyza huidobrensis),* American serpentine leaf miner *(Liriomyza trifolii)*	23-Apr-21	30-Apr-24	Hort Innovation	All states and territories, except VIC
PER91155	Various vegetables, culinary herbs and ornamentals – nursery (non-bearing). Please refer to the APVMA website for full list.	Insecticide	Spinetoram	Leafminers (*Liriomyza* spp.) including: vegetable leaf miner (*Liriomyza sativae*), pea leaf miner/ serpentine leaf miner (*Liriomyza huidobrensis*), American serpentine leaf miner (*Liriomyza trifolii*)	09-Jun-21	30-Jun-24	Hort Innovation	All states and territories, except VIC
PER91161	Brassica leafy vegetables, including Chinese broccoli, Chinese cabbage, garden cress, kale and rocket; leafy vegetables, including lettuce, endive, silverbeet, spinach and chard	Insecticide	Chlorantra-niliprole + Thiamethox-am	Leafminers (*Liriomyza* spp.) including: vegetable leaf miner (*Liriomyza sativae*), pea leaf miner/ serpentine leaf miner (*Liriomyza huidobrensis*), American serpentine leaf miner (*Liriomyza trifolii*)	09-Jun-21	30-Jun-24	Hort Innovation	All states and territories, except VIC
PER14326 Version 4	Capsicum, chilli peppers, cucumbers, leafy lettuce. Field or protected crops	Fungicide	Captan	Grey mould (*Botrytis cinerea*)	19-Dec-13	30-Jun-24	Hort Innovation	All states and territories, except VIC
PER90595	Beetroot	Fungicide	Metalaxyl-M + Azoxystrobin	Pythium and rhizoctonia (directed application at planting)	30-Jun-21	30-Jun-24	Hort Innovation	All states and territories, except VIC
PER81589 Version 3	Parsley, snow peas, sugar snap peas, cucumber, beetroot leaves, chicory and endive	Fungicide	Iprodione	Sclerotinia rot and grey mould. Beetroot – sclerotinia rot, grey mould & Alternaria leaf spot.	21-Sep-16	30-Jun-26	Hort Innovation	All states, except VIC
PER14964 Version 4	Lettuce (head and leafy varieties) – plant nursery phase, prior to planting in the field	Fungicide	Chlorothalonil	Anthracnose or shot hole	21-Dec-14	31-Jul-26	Hort Innovation	All states, except VIC

Permit Number	Crop	Pesticide Group	Active	Pest/Plant disease/ Target weed	Date Issued	Expiry Date	Permit Holder	States
PER86665 Version 2	Carrots	Insecticide	Fipronil	Whitefringed weevil and symphylids	04-Jan-19	31-Jul-24	Hort Innovation	All states and territories, except VIC
PER14186 Version 4	Eggplant/aubergine	Insecticide	Spinetoram	Melon thrips	03-Oct-13	30-Sep-24	Hort Innovation	All states and territories, except VIC
PER13152 Version 4	Rhubarb	Herbicide	MCPA	Broadleaf weeds	04-Dec-11	30-Sep-26	Hort Innovation	All states and territories, except VIC
PER14210 Version 4	Lettuce (head and leafy varieties) grown in protected situations only	Miticide	Bifenazate	Two-spotted mite	17-Oct-13	30-Apr-22	Hort Innovation	QLD, SA and WA only
PER13673 Version 4	Silverbeet and spinach; celery	Fungicide	Metalaxyl-M + Mancozeb	Silverbeet and spinach – downy mildew. Celery – Septoria leaf spot or late blight	22-Apr-13	31-Jul-26	Hort Innovation	All states and territories, except VIC
PER84890 Version 3	Beans: All types of fresh beans including butter, flat, French, green, snake and string beans (field grown only)	N/A	Pyriproxyfen	Silverleaf whitefly	15-May-18	31-Jul-24	Hort Innovation	All states and territories, except VIC
PER14583* Version 5	Various vegetables – please refer to the APVMA website	Insecticide	Chlorpyrifos	African black beetle, false wireworms and wireworms; Vegetable weevil	01-Apr-14	31-Oct-24	Hort Innovation	All states and territories, except VIC
PER90820 Version 3	Various crops including sweetcorn, root and tuber vegetables, legume vegetables, fruiting vegetables, other than cucurbits, leafy vegetables (including brassica leafy vegetables) and ornamentals flowers and plants	Fawligen Fall Armyworm Biocontrol	Spodoptera Frugiperda Multiple Nucle-opolyhedrovirus (SfMNPV)	Fall armyworm	30-Mar-21	31-Mar-24	AgBiTech Pty Ltd	All states and territories

Please note:

*Continued issuance of this permit is subject to the outcomes of the current APVMA review of chlorpyrifos. This permit may be impacted by the outcomes of this review.

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: portal.apvma.gov.au/permits.

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

Investigating ammonium stabilisers in veg production

It has been discovered that the use of ammonium stabilisers has a lot to offer when it comes to reducing greenhouse gas emissions in vegetable production. *Vegetables Australia* takes a look at trials that were conducted in Victoria, and the outcomes for vegetable growers.

Focusing on fertiliser management produced immediate results in reducing nitrous oxide (N2O), greenhouse gas emissions and improved nitrogen (N) efficiency. Trials on the east coast of Australia indicated that ammonium stabiliser treatment contributed to the reduction in denitrification and N2O emissions, reduced leaching, and improved yields.

Including an ammonium stabiliser – such as Incitec Pivot's Entec® and eNpower™ minimises N losses, provides a more sustained N supply to the crop resulting in the potential for improved yield and quality.

Applied at the same time as conventional fertiliser, they keep N in the stable ammonium form so that it remains in the soil and is available to the crop for longer. It is an effective fertiliser option, as it slows the conversion rate of ammonium to nitrate.

Ammonium leaches very little and cannot denitrify at all. This is the opposite to nitrate, which is prone to both leaching and denitrification. A treated fertiliser potentially prevents these losses from happening.

In Victorian trials, ENTEC Nitrophoska® Special was shown to reduce the average nitrous oxide N2O emission loss by 69 to 100% compared to traditional 'untreated' fertilisers. These same trial results indicated that at least one fertiliser application could be dropped due to improved N efficiency.

This saves fertiliser costs, fuel costs and labour costs estimated at over $500/ha, and also indirectly also allows reduced fertiliser application rates for crop production which will further lower N2O emissions.

Not a controlled release fertiliser

Often mistaken for a slow-release fertiliser, an ammonium stabiliser is not a plastic nor polymer coated product.

Polymer coated controlled release fertilisers break down to release nutrients over time, whereas ammonium stabilisers work by inhibiting the Nitrosomonas group of soil bacteria ('bacteriastatic' action), which really means N is kept in the topsoil as ammonium for a longer period.

Controlled release fertilisers release small amounts of N, and the availability of it may not always be enough to meet crop demand as well as potentially leaving micro plastics residues in soil.

However, the stabilising of the ammonium means that the N is available to the crop as it requires, resulting in potential increased yield. The advantage is that all N is made available to the plant – and not restricted by the release pattern of controlled release products.

Considering ammonium stabilisers in vegetables

Crop type, soils, climate, fertilisers and irrigation methods should be considered when contemplating the use of ASs. Broccoli and potato trials (refer to table below) have shown statistically significant and positive results under these considerations.

ENTEC or eNpower treated fertilisers are ideal for pre-plant and planting in vegetable crops.

These ammonium stabilisers are designed to improve the efficiency of applied N and minimise the potentially negative effects of uncontrolled growth flushes and nitrate spikes.

They also potentially minimise side-dress applications, where otherwise significant nitrogen losses would have occurred. It was demonstrated that one fertiliser application could be dropped in Victoria due to enhanced N use efficiency.

As with any fertiliser decision, choosing to purchase and use ENTEC- or eNpower-treated fertilisers should be based on a sound understanding of the soil nutrient status and the requirements of the crop. Arranging soil testing and analysis through the Nutrient Advantage® laboratory will help to determine an appropriate fertiliser strategy.

Entec Trials – Horticultural crop, yield responses.

Crop	Location and year	Product/s	Entec Blend Yield	Conventional Blend Yield	Percentage Yield Increase Over Conventional	Statistics
Potato	Atherton Tablelands, 2011	ENTEC CK 800 v CK 800 (each applied at 1850kg/ha) + Calcium Nitrate 250kg/ha (3 wks post emergence)	39.25 t/ha	34.95 t/ha	12.3%	LSD 3.79 P = 0.05
Potato	Atherton Tablelands, 2011	ENTEC Nitrophoska® Special v Nitrophoska® Sprecial (each applied at 1250kg/ha) + Calcium Nitrate 250kg/ha (3wks post emergence)	36.55 t/ha	32.10 t/ha	13.9%	LSD 3.79 P = 0.05
Potato	Pinaroo, 2016	ENTEC Nitrophoska® Special v Nitrophoska® Sprecial (each applied at 400kg/ha)	73.05 t/ha	59.65 t/ha	22.5%	LSD 10.55 P = 0.05
Broccolli	Boneo, 2012	ENTEC Nitrophoska® Special v Nitrophoska® Sprecial (each applied at 400kg/ha) + Calcium Nitrate with boron at 40kg/ha (budding)	4.98 kg/plot	3.23kg/plot	58.6	LSD 1.29 P = 0.001
Broccolli	Boneo, 2012	ENTEC Nitrophoska® Special v Nitrophoska® Sprecial (each applied at 600kg/ha) + Calcium Nitrate with boron at 40kg/ha (budding)	5.55kg/plot	3.14kg/plot	76.8%	LSD 1.29 P = 0.001

Find out more

Please visit ipfhorticulture.com.au

Growcom

Last year, Growcom applauded an election commitment made by the Palaszczuk Government to discount irrigation water prices for the horticulture sector by 50 per cent.

This commitment amounts to an estimated $23 million spend over three years, and is the single largest investment by the Queensland Government in the horticulture sector to promote its growth and create more regional jobs.

Fruit, vegetable and nut growers who are Sunwater, Seqwater or Pioneer Valley Scheme customers will be able to apply for the discount as a rebate on their first water bill for this current financial year. They can make a claim on every bill they get or wait to receive the discount as a lump sum at the end of the three years.

Promoting extra production is important, but so is ensuring we have the people in place to harvest it. The Queensland Government is lending a hand here too.

Also last year – ahead of the state election, and in response to seasonal labour shortages – Treasurer Cameron Dick announced a scheme to pay workers $1,500 to relocate to the regions to take up harvest roles.

The government has recently reworked the scheme and launched it again, this time branded as the #pickqldbonus.

The old scheme was only open to Queensland residents. Many more workers who are new to horticulture, including visa holders, will now be eligible for the $1,500 bonus payment. It's also now easier to meet the work requirement in terms of days on-farm. There's also now no need for workers to relocate.

Growcom is encouraging all employers to take a look at the scheme and think about how they can use it to attract the workers they need this season.

Taken together, these are two important interventions from the Queensland Government in addressing our short-term constraints and future sustainability.

These investments are underpinned by an appreciation within government that few, if any, industries can convert water, energy and other resources into regional wealth and jobs as well as horticulture.

For more information on the irrigation water discount and to make an application, visit the Queensland Rural and Industry Development Authority website: qrida.qld.gov.au/program/horticulture-irrigation-pricing-rebate-scheme.

For more information on the #pickqldbonus, visit the Queensland Government website: qld.gov.au/about/pickqld/pickqld-bonus.

Stephen Barnard
Growcom
Chief Executive Officer

Primary Producers House
Level 3, 183 North Quay
Brisbane, QLD 4000
Phone: 07 3620 3844
Fax: 07 3620 3880

NSW Farmers' Association

Ongoing workforce challenges facing the horticulture industry here in New South Wales – and nationally – were the focus of discussion and policy development at the NSW Farmers Horticulture Section Annual General Meeting (AGM) held on 12 July. Despite the need to move the AGM online for the second year running, the two hours consisted of fruitful and robust discussions.

The Horticulture Section members developed three new motions to support horticulture growers in NSW during these challenging times and into the future. The new policies focus on obtaining government support to build housing for farm employees, noting the critical shortage of suitable accommodation in many regions and the issues growers face with local government approvals for such infrastructure. Also, the extension of the Emergency Water Infrastructure Rebate – currently only available to perennial crop enterprises – to all horticultural growers, and firm support of an Agricultural Visa to enable access to foreign workers for seasonal agricultural work. Further discussions focused on the value of the horticulture sector to the NSW economy as well as capital gains tax for agriculture businesses.

Four committee vacancies were filled during the AGM by ballot prior and nomination at the meeting. The Committee for 2021/2022 will consist of Guy Gaeta (Central West), Paul Shoker (North Coast), Susan Brighenti (Riverina), Brett Guthrey (Sydney/South-East), Johanna Brighenti (Riverina), Om Jhorar (North Coast), Chris Stillard (Riverina) and Warren Waddell (Sydney/South-East). Guy Gaeta was re-elected as Committee Chair and Johanna Brighenti was appointed Committee Vice-Chair.

Key priorities for the Committee in the year ahead will build on those from 2020/21 and include securing funding for flying fox netting; advocating for continuation and support of the Seasonal Pest Absence protocol trials; developing harvest labour solutions for the industry in NSW; and advocating for international freight assistance and development of new markets.

Due to NSW Farmers' relentless advocacy, in April 2021 the NSW government announced a 50 per cent subsidy to support horticultural growers with the cost of hotel quarantine for overseas seasonal workers, reducing the costs from $3,000 to $1,500 per worker. More recently, our engagement with the NSW Government saw the rollover of this program into the 2021/22 financial year.

Christian Staacke
NSW Farmers' Association
Policy Director – Plant Industries

Level 4, 154 Pacific Highway
St Leonards, NSW 2065
Phone: 1300 794 000
Fax: 02 8282 4500
Website: nswfarmers.org.au

Tasmanian Farmers and Graziers Association

The past year has had many sectors of our industry on a steep learning curve for several challenging reasons. The impacts of worker shortages, reduced access to local and international markets and changing rules and restrictions between states has kept everyone guessing just what will happen next.

However, no-one has gone hungry in Australia and investment in agriculture has continued; demand for land has remained high and – as I've spoken about previously – international money is flowing into our agricultural economy. Yes we have challenges, but the opportunities are plentiful in Australian farming at the moment. It is clearer now more than ever that Australia needs farmers and the associated industries that sit alongside us.

There are records being broken for certain livestock, grain and land prices, but there is one sector being held back and it's not just because of a pandemic, and that is our vegetable growing sector –for both processing and for the supermarket shelve.

It is easy to identify that the commodities faring well at the moment are the ones that are not heavily aligned with any of the major retailers. Red meat prices are soaring, retail outlets have reported billions in profits during a pandemic, wait times for vehicles and machinery are measured in months or years and right in the middle of this so-called crisis, are the vegetable growers struggling to claw just a few cents per kilo out of the retail end of the market to help keep pace with rising costs.

Has the Australian consumer been conditioned to a point where food is well down the list of necessities within the weekly budget – below the internet streaming services, below the online shopping for imported goods, below the latest phone or gadget? I think many an Australian farmer would say yes to that.

While not wanting to sound too political, it must be said that practically every other nation is pouring money into their economy and as a result, big businesses around the globe are wanting a piece of the action.

In Australia, we are too vulnerable. Already for the coming season, fuel, fertiliser, chemicals and machinery costs are increasing at a steady rate. The few cents per kilo needed at the check-out is already swallowed up before our returns even look like improving. As an industry, we need to not just focus on R&D or marketing opportunities, but also investing back into ourselves to maintain profitability. How we do that is up to us.

Good growing for the upcoming season.

Nathan Richardson
Tasmanian Farmers and Graziers Association
Vegetable Council Chair

56a Charles St
Launceston, TAS 7250
Phone: 03 6332 1800

AUSVEG SA

AUSVEG SA continues to advocate on behalf of South Australian vegetable growers. It has been a challenging time for the industry – marked by further lockdowns, supply and workforce management challenges – and a key national inquiry into the future of piece-rates in our sector.

AUSVEG SA is working with AUSVEG and other state counterparts to press for immediate action on the Agriculture Visa that was recently announced by the Federal Government. This proposed visa was announced following the United Kingdom FTA agreement and concerns that requirements for backpackers to work in regional areas would be scrapped under this agreement.

As an alternative, Federal Agriculture Minister David Littleproud announced the intention to develop a dedicated Agriculture Visa geared towards countries in the Asia-Pacific to supplement the loss of this workforce due to the COVID-19 pandemic. AUSVEG SA and its national and state counterparts are concerned about the lack of progress on development of the visa since it was announced, and are working with national bodies to keep pressure applied on this critical issue.

AUSVEG SA is watching current Fair Work Commission hearings regarding the validity and application of piece-rates in horticulture. The national cases to the commission on behalf of horticulture are being led by the Australian Fresh Produce Alliance and the National Farmers Federation.

Piece rates are a valuable productivity tool for growers across Australian horticulture; however, their applicability is under attack from unions concerned about instances of underpayment of workers. The findings of the Fair Work Commission will have implications for whether piece-rates will be able to be used and if so, under what →

Jordan Brooke-Barnett
AUSVEG SA
Chief Executive Officer

South Australian Produce Markets,
Burma Road
Pooraka, SA 5095
Phone: 08 8221 5220

conditions for the future. AUSVEG SA will update members once findings are handed down in the coming months.

In other news, AUSVEG SA hosted a parliamentary committee investigating stormwater management responses across the state. The committee featured key figures including The Hon. David Ridgway MLC, Terry Stephens MLC, Frank Pangallo MLC and Justin Hanson MLC.

The committee met with a number of key landholders in the Northern Adelaide Plains and will be presenting a report to parliament recommending immediate action on the cleaning of the Gawler River catchment.

There will also be a critique of the lack of action in the spending and allocation of $9 million towards river cleaning, along with a lack of movement in developing a long-term solution to protect landholders.

AUSVEG SA will continue to campaign on this issue on behalf of the Northern Adelaide Plains community, and hopes to see site works and river cleaning commence as soon as possible.

vegetablesWA

I would like to introduce myself as the Acting Chief Executive Officer (CEO) of vegetablesWA in what's an exciting time for the Western Australian vegetable industry.

I would like to thank our former CEO, John Shannon, who has left to pursue new opportunities.

John has had a long history with vegetablesWA – he commenced with the association in 2009 and served as CEO for the last six years. John has been a strong advocate for the needs and interests of Western Australian vegetable growers for over a decade, and his presence will be missed. We wish John all the best and thank him for his contribution to the WA horticulture industry.

I have worked at vegetablesWA for the last three and half years leading the Export Facilitator Project, which has allowed me to develop a good understanding of the WA vegetable industry.

Prior to that, I worked for more than 10 years for the Department of Agriculture and Food WA in various industry development, management and policy roles – mainly around the beef industry and export development. I'm looking forward to the challenge of leading vegetablesWA for the remainder of 2021, as well as working more closely with our members and stakeholders.

At the end of July, we also said goodbye to Amber Atkinson and Kit Sainsbury. Amber was vegetablesWA's Communications and Policy Officer for around two years; coordinating our weekly e-newsletter, as well as industry updates, webinars and the quarterly *WA Grower* magazine. Amber has been a great asset to the association, and she really lifted our communication to a new level. We wish her well in her new role with the Grower Group Alliance.

Kit was the vegetablesWA Labour Scheme Facilitator. Over the past 12 months, the scope of the Labour Scheme Facilitator Project has expanded to cover industries beyond horticulture and is heavily utilised by other sectors, including meat processing, tourism and hospitality.

A decision was made to move this role from vegetablesWA to the Western Australian Department of Primary of Industries and Regional Development. The decision came after both parties reviewed the current structure of the project and saw an opportunity for a new approach that would provide a better solution for all industries.

Since the beginning of the project, vegetablesWA has facilitated the arrival of nine flights from the Pacific that brought in more than 1,300 workers. vegetablesWA would like to thank Kit for his enthusiastic service to the project and our grower members.

While there are a lot of changes happening within vegetablesWA, we are taking this as an opportunity to get back to basics and increase our engagement with members while focusing on delivering value to industry.

Manus Stockdale
vegetablesWA
Acting CEO

702-704 Murray Street
West Perth, WA 6005
Phone: 08 9486 7515
Website: vegetableswa.com.au
Email: manus.stockdale@vegetableswa.com.au

NT Farmers Association

Securing labour continues to be the top priority for our producers in the north. The Dry Season is typically our busiest production time, and the number of seasonal workers required is significant. A number of growers this year have reduced plantings due to the challenges of finding suitable and reliable staff. NT Farmers has played a large and continual role in supporting industry and lobbying to the government for the approval of seasonal workers from our neighbouring ASEAN countries.

To date, two planes have been scheduled to arrive in Darwin in September to assist with these labour shortages. Workers will undergo their 14-day quarantine at the Howards Springs Facility, before being billeted out to a range of producers who have expressed interest in acquiring them. This comes at an extra cost to the producers on top of the award wages paid. NT Farmers will assist with the recruitment processes for the workers on to farm.

Meanwhile, Rural Business Support has delivered a series of online and in-person financial fitness workshops across the Territory. This included a special targeted face-to-face event for Darwin's Vietnamese growing community. This was well-supported, with over 30 local Vietnamese growers in attendance. The workshops were designed to enhance your financial wealth and knowledge focusing on developing a greater understanding around financial decision making, creating usable budgets, workforce issues, the importance of biosecurity and more.

Soil water monitoring probes have recently been installed on two regional vegetable farms in the Darwin rural area.

The data collected from these probes will assist growers to embrace improved irrigation monitoring technology and management systems, as well as benchmark water use against productivity to get the best out of our water resources. This will enable Top End growers to only use the optimum water required to reduce the pressure on our water resources, especially in the Katherine and Darwin aquafers.

Simone Cameron
NT Farmers Association
VegNET Regional Development Officer

Phone: 0413 308 335
Website: ntfarmers.org.au
Email: ido@ntfarmers.org.au

AUSVEG VIC

It was extremely pleasing to see Victorians receive four awards at the 2021 National Awards for Excellence, which were held in June at the Brisbane Convention and Exhibition Centre.

Catherine Velisha took home the Boomaroo Nurseries Women in Horticulture Award; Xavier Toohey picked up the Corteva Agriscience Young Grower of the Year award; East Gippsland Vegetable Innovation Days received the VISY Industry Impact Award; and Mark and Darren Todaro were recognised with the Butler Market Gardens Environmental and Sustainability Award. Congratulations to all Victorian winners and nominees this year.

Meanwhile, labour continues to be a priority. AUSVEG VIC – along with other horticulture industry associations – has been in talks with Agriculture Victoria and the state's Agriculture Minister, the Hon. Mary-Anne Thomas, regarding the workforce shortages that growing operations continue to face. The announcement on 7 September 2021 to extend the quarantine pathway with Tasmania to allow up to 1,500 workers from the Pacific Islands as part of the Seasonal Worker Programme and Pacific Labour Scheme will provide many Victorian vegetable growers with confidence for this season's peak harvest period.

AUSVEG VIC is also in discussions with Ballarat growers in relation to the proposed Western Victorian Transmission Network Project that will directly affect around 45 potato growing businesses.

AUSVEG VIC met with the Ballarat Potato Council in July to discuss the project and the imminent threat it poses to potato growers, the community and Australia's supply of processing potatoes. Working with the Victorian Farmers Federation, AUSVEG VIC – in conjunction with AUSVEG– will consult with relevant government stakeholders to ensure growers' voices are heard, and the direct and indirect costs on the community are appropriately considered when determining the next phases of the project. I would like to thank AUSVEG for its support during these initial discussions.

Finally, AUSVEG VIC has been awarded the Seasonal Industry Support Program project delivery for filming and communicating six COVID-Safe videos. These videos will target seasonal workers, and drive adoption of COVID-Safe practices along with improving industry perception. They will also be translated to the workers' native languages to ensure these practices are clearly communicated. Through collaboration with key local councils across Victoria and two-way consultation with labour hire companies, the videos will be promoted to Victorian horticulture businesses and its workers.

Tim Withers
AUSVEG VIC
Executive Officer

3 Glenarm Road
Glen Iris, VIC 3146
Phone: 03 9882 0277
Website: ausvegvic.com.au
Email: info@ausvegvic.com.au

VGA trading as AUSVEG VIC

GIVE YOUR PRODUCTION AN ASA-'LIFT'

When it comes to harvesting, ASA–LIFT brings you innovative, specialised crop solutions to drive production further.

Since 1936 ASA-LIFT has built a solid reputation for quality, innovation and constant evolution to meet market demands. Maximise your harvest with an ASA-LIFT mounted, trailed or self propelled vegetable harvester - now proudly available from LANDPOWER Vegetable Centre.

For your local LANDPOWER Vegetable Centre dealer go to:

vegetablecentre.com

LANDPOWER Vegetable Centre